CHAMORRO CULTURAL AND RESEARCH CENTER

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Submitted towards the fulfillment of the requirements for the Doctor of Architecture degree.

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December 2009

We certify that we have read this Doctorate Project and that, in our opinion, it is satisfactory in scope and quality in partial fulfillment for the degree of Doctor of Architecture in the School of Architecture, University of Hawaiʻi at Mānoa.

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ABSTRACT

PURPOSE

My architectural doctorate thesis, titled 'Chamorro Cultural and Research Center', is the final educational work that displays the wealth of knowledge that I have obtained throughout the last nine years of my life. In this single document, it represents who I have become and identifies the path that I will be traveling in the years to follow.

One thing was for certain when beginning this process, in that Guam and my Chamorro heritage were to be important components of the thesis. The thesis is the initial step in fulfilling my personal interest in my heritage. Although I am of Chamorro descent, I am not fully aware of where I came from and who my ancestors were. Once I learn more about Guam and her history, I will begin to discover who I am. It is about understanding your origins and respecting your culture. The best way in capturing this is through the design of a cultural and research center,

making it available for the world to celebrate and continue to uncover the history of the Chamorros.

GOALS

The overall goal of the thesis is to become educated with the history of Guam and the Ancient Chamorros. It is to learn about their way of life, their culture, values and practices. The Ancient Chamorro culture was based on oral traditions, therefore much of the information has vanished with time. The objective is to gain knowledge of the Ancient Chamorros and investigate how their existence has been threatened.

With the research that is conducted, it is to be applied it to designing the Chamorro Cultural and Research Center (CCRC) on Guam. The Center, in form and function, will help keep alive the Chamorro heritage for years to come. It will be where locals and visitors alike become educated on the history of Guam, as well as conduct research to further expand the knowledge of the origin of the Chamorros. The goal is to create an architectural expression that celebrates the appreciation of the culture of the indigenous Chamorros of Guam.

METHODOLOGY

Research

There are two components of my thesis, the research and design aspects. The research that has been conducted on my topic includes the history and culture of Guam, looking at the Pre-latte Period all the way to present day. The information that was collected will be interpreted and applied to the architectural design of the CCRC. In addition, it will help to identify what will be housed in the Center and what types of activities will take place. As indicated by its name, the Center has two functions, it is a place to conduct research, as well as a place for the local population and tourist to gather and learn about the Chamorros.

The use of Case Studies is a factor in component to the design of the Center, as it will identify major components that have to be incorporated into the design and provide a basis for comparison for the work. Understanding the approach and method of design for the Case Studies are guidelines that can be used when designing the Center. As a result of the Center being focused on the cultural and research aspects of Guam, it will be beneficial to investigate buildings of similar functions that have been constructed. During the research phase, both cultural and research centers are explored that represent other indigenous people of the Pacific, as well as the Americas.

With a design based thesis, it is important to assign a specific site for the Center. The location of the Center is in the village of Tumon, a site of an arterial ancient village rich with artifacts that display the Chamorro history. Before designing, it is essential to become well acquainted with the site and to have a thorough understanding of it.

Design

With the research portion completed, the design of the Center will follow. There are four phases in the design component of the Center: Conceptual Design Phase, Schematic Design Phase, Design Development Phase, and the Presentation Documents Phase. A site evaluation and program had already been completed during the research segment, however as the design moves forward, it may be important to reevaluate these areas. The key part in the initial design phase is developing a concept and understanding what the Center is going to be used for. During the initial stages of the Conceptual Design Phase, a total of three concepts are going to be identified and evaluated through idea and design. Although the program for all three scenarios will be the same, the concept and how culture is translated into the building's form will be unique. Further investigating the program and starting to work on massing study models will also be taking place.

After the Conceptual Design Phase is completed, next is the Schematic Development Phase. Of the three concepts created in the previous Phase, only one will be selected and design efforts will proceed. After which, the Design Development Phase will begin and the drawings are developed and design problems are addressed. Decisions made in the Schematic Design Phase are worked out at a more detailed level. All aspects of the design are developed at this point. The final stage, Presentation Documents Phase, will be the creation of the presentation documents used in the Final Document and Final Oral Defense.

FIELD OF STUDY

Far away and hidden in the deep waters of the Pacific Ocean, lays a small tropical island of about 213 square miles. Until today, the island known as Guam, her origin and the history of her people remains a mystery. A culture based on oral traditions, little remains of the indigenous Chamorro, other than stories passed down for generations and magnificent architectural structures that whisper the existence of a once near extinct race of people. Who are they, where did they come from and what has become of them today?

Throughout the history of Guam, its control has changed foreign hands several times. The first was under the Spanish for about 333 years, after which it became the possession of the United States, 1898; Japan, 1941; and of the United States again in 1944.[1] As a result of these specific events in history, the Chamorro population has been slowly diminishing and losing their identity. In hopes to revive the Chamorro heritage, this Project is based on a topic that will help to spread the history of Guam and her original people. CCRC will be a haven where visitors can become

[1] Sanchez, Pedro C. Guahan Guam The History of our Island. (Agana: Sanchez Publishing House, 1985) 31.

educated about all facets of Guam, as well as conduct research to further expand our knowledge of the origin of the Chamorros.

The sources that have been reviewed provide information on the history of Guam and her indigenous people. It is material that assists me in supporting my argument that the existence of the Chamorro race was substantially threatened with the spread of Christianity, almost 150 years after the discovery of the island. It is then when we as a Chamorro race began to lose their identity. Some may argue that it was when Ferdinand Magellan first stepped foot on the island when traveling to the East. After which, other countries, including the Dutch and English, stopped at the islands spontaneously, however only for the purpose of stocking up on their supplies of fresh water and food. They would stay only for short durations. During which some may believe that they had no interest with Guam, other than that the island being a regular stopping point as a source of supplies. Yes, this did impact the Chamorros, in that it broadened their perspective of the outside world. However, they still believed that they were at the center of the world, they still carried on the same way of life, maintaining their language, traditions and culture.

In contrast, this project's position is that it was not until Father San Vitores began his mission in the Northern Marianas Islands, marking the start of colonization. It was during this period when change was brought to the Marianas Islands. San Vitores' efforts in spreading Christianity meant that the Chamorros had to let go of their culture. Some were eager to learn and welcomed this new way of life, while others resented it and refused to convert. Christianity replaced the Chamorros beliefs in myths, superstitions and ancestor worship. The Chamorro villages were reorganized into Spanish *barrio* system, the church became the center. Although

the Chamorros continued to farm and fish, they would also use these items to trade for European goods such as clothing, metal tools, etc. Their traditional way of life was beginning to be lost.

The main focus of the Center will be the Ancient Chamorros, prior to contact with the Western world. This is when they were in their purest form, untouched by the world. It is to capture and preserve who they were before colonization, before they began losing their identity. This is the identity of Guam that has been lost and its awareness is important to the development of the island and her people. The Center will be limited to the Post-contact period presence in the Center, not wanting to expand on the island's history during the Spanish, American and Japanese periods. Although these are important eras in the development of the island, it does not represent who the Chamorros were before contact.

In a couple of years, what is left of the island and her heritage will be once again threatened. The impending relocation of 8,000 United States Marines and their 9,000 dependents and support personnel from Okinawa, Japan to Guam will greatly impact the island's economy and identity.[2] With the Defense construction, $15 billion will be poured into the island.[3] This rapid increase in population will have unforeseen impacts on the islands' culture. This is why now more than ever, such a place as the CCRC is important to maintain and preserve the culture and tradition of Guam and her people.

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[2] Tamondong, Dionesis. "Residents eye better jobs: More jobs, challenges expected to come with buildup." Guam Pacific Daily News 28 April 2009.
[3] Brooks, Donovan. "Imported Labor Critical to Guam Construction Industry." Building Industry Dec. 2008: 76-85.

DOCTORATE PROJECT STATEMENT

An Architectural Expression That Celebrates the Culture of the Indigenous Chamorros of Guam.

The focus of the project is to design a Center that will support future discoveries of the history and heritage of the Chamorros, while concurrently paying respect to the local cultural traditions of Guam. The goal is to translate culture into a building, through engaging in the local traditions and history of the island.

As previously stated, the focus of CCRC is of the Chamorro history and culture prior to contact with the Western world. The traditional life style of the people will define the purpose of the Center as well as inspire the design. The critical parts in designing a successful Center is by

learning the history of Guam, in addition to the way of life of the Chamorros. This includes, their values, social traditions, beliefs, etc. From the start of this project, and throughout design, the traditional life style will be continuously researched and evaluated to help strengthen the design and purpose of the Center.

phase 01

THE RESEARCH

PRE-CONTACT

In order to understand where one is going, they must first understand where they came from. The main focus of the CCRC regarding the design and function, is to celebrate the history and culture of the Chamorros from the Pre-Contact period This section is one of the more vital parts of the entire research process. It will define who the Center is for and what it represents. In addition, it will be the source of inspiration, the foundation of the design of the Center.

The Ancient Chamorros of Guam practice an oral tradition, passing down their culture and history from generation to generation. With the lack of written documentation, the way of life that existed has slowly died with time. The only knowledge present today are the artifacts they left behind, as well as the accounts from the first European settlers on the island almost 500 years ago. The accuracy of such accounts is filtered through the perspective of outsiders that viewed the Ancient Chamorros through their own lens. With this limited data available, we attempt to put the pieces of the puzzle together in hopes of uncovering the origins of a now extinct Ancient Chamorro race.

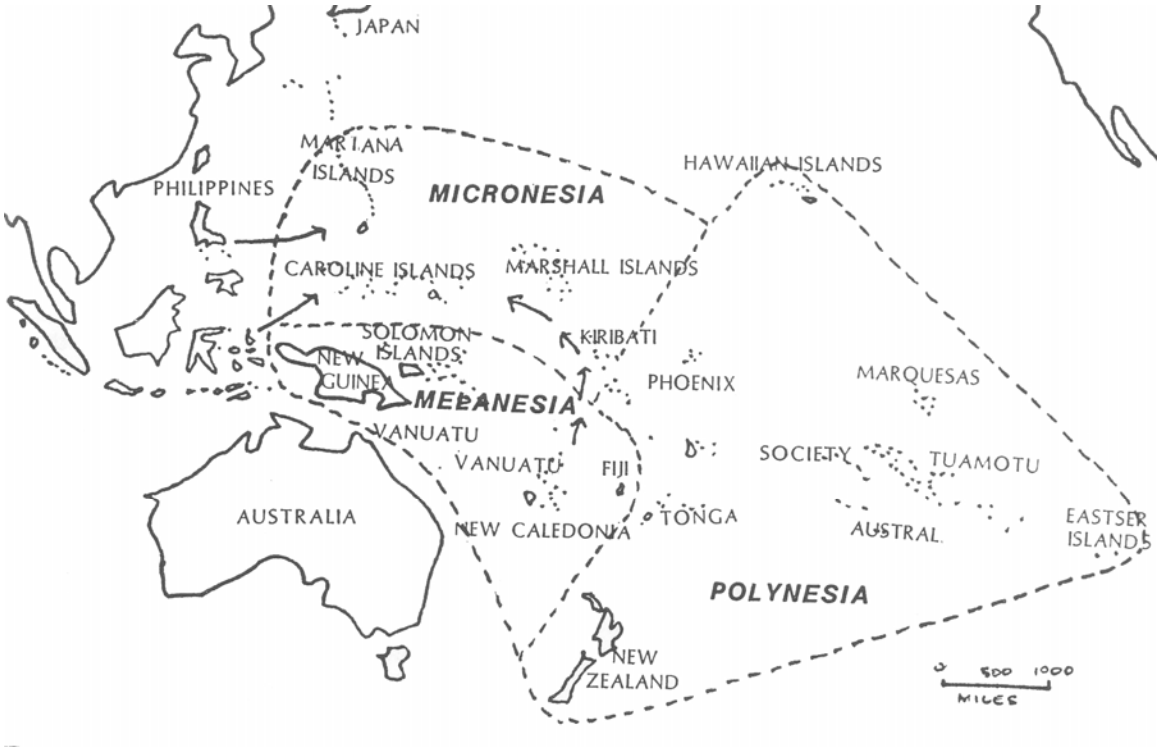
The Origins of Ancient Chamorros

The origin of the Ancient Chamorros began thousands of years ago, with one of the strongest theories starting at the opposite face of the globe, in Europe. During the years between 20,000 and 12,000 B.C., the mass migration of people from the Caspian Sea region began with the substantial move between 2,000 B.C. and A.D. 500.[4] Caucasoids, the native people of Europe, North Africa, and Southwest Asia, relocated to every direction, east to Asia, west to Europe, and as far as the African continent. A new race was created by those who migrated east, who procreated with the Negroids, those native to Africa, and Mongoloids. The Mongoloids, who originated in Northeast Asia, began moving south into China. The migration led to the creation of a new race, a mix between Mongoloids, Caucasoids and Negroids. This race had established an agricultural civilization on their new home lands. When word spread of their agricultural

[4] Carano, Paul. A Complete History of Guam. (Tokyo: Charles E. Tuttle Company, 1964) 3-4.

based lifestyle, other Mongoloids from the north followed and moved south, into China, Southeast Asia and continued throughout the Pacific region. The true reason(s) for the mass migration remains unknown till today, however some explanations may be the overpopulation of their homelands, the search of food, etc.

Figure 1 Migration Map.[5]



Sources say that the migration into the Pacific Ocean was divided into three movements, with the first settled in Polynesia, excluding the islands of Hawai'i. Second were those that settled in Hawai'i and the Marquesas Islands. People from Southeast Asia made up the third movement, who after passing between New Guinea and the Philippines, they split into two groups. One group traveled south to the New Guinea, while the second group went east into Micronesia,

[5] Cunningham, Lawrence J. Ancient Chamorro Society. (Honolulu: The Bess Press, Inc., 1992) 3.

where they came in contact with Guam. Studies show that the island first became inhabited as early as the 1500s B.C. Prior to contact with the western world, Guam's history was divided into two phases. The Pre-*Latte* Period which began in 1527 B.C., and the *Latte* Period, from A.D. 854 to when the Spanish discovered the island in 1521.

When the Spanish asked the Ancient Chamorros where they came from, they were told the myth of *Puntán* and *Fu'uña*, siblings born into an empty world with no parents. In order to create life, *Puntán* asked his sister that after his death to create the universe by using his remains. As he wished, *Fu'uña* his eyes became the sun and moon, while his eyebrows became rainbows. From this, the universe was created and was home to the spirits. A tortured soul escaped from Mt. Sasalaguan, where a devil named *Chaife* lived. After his freedom, from the red earth and heat of the sun, he made human beings at Fouha Bay. The Ancient Chamorros believed that life on Earth originated from Fouha Bay and that they were at the center of the universe, typical view of other indigenous people.[6]

There are several theories that explain the origins of "Chamorro", the word used to describe the indigenous people of Guam and the Marianas Islands. One theory states that it came from the indigenous word *Chamurre*, which was used by the Ancient Chamorros in reference to the people of the Marianas. Another explanation is believed that the Spanish gave the people the name, which was derived from the word *chamorri*, the highest ranking nobles or chiefs. Those with this rank had shaved heads. Hence, the word "Chamorro" as defined in Spanish is "shaven

[6] Cunningham, Lawrence J. Ancient Chamorro Society. (Honolulu: The Bess Press, Inc., 1992) 3.

head", however this was not reported until 1668 during the time of Father Diego Luis de San Vitores, the Spanish priest who introduced the Christian faith to the Ancient Chamorros .[7]

The Ancient Chamorro People

As described by Father San Vitores during his mission that began in 1668, the Ancient Chamorros had "yellowish brown skin color… and [were] larger in stature, more corpulent and robust than Europeans".[8] At the time of discovery in 1521, the men and women wore their hair long and lose, and occasionally tied it into one or two knots, possibly to signify their rank. Centuries later, Father San Vitores states the women wore their hair long, which was bleached white by the use of lime. In contrast, the men had shaved heads, leaving only a small gathering of hair at the crown, which they would tie in a knot.

It is said that the Ancient Chamorro men walked the earth naked and wore no clothing. Some accounts state that the women wore no clothing as well, while others note that they had different types of clothing that they would wear. Typically, they would dress in a "fringe of grass or leaves hanging from a belt". They would also wear *tifis*, which was an apron made of "the inner bark of a palm".[9] For protection from the sun, they would wear "small palm [pandanus]

[7] Cunningham, Lawrence J. Ancient Chamorro Society. (Honolulu: The Bess Press, Inc., 1992) 1.
[8] Garcia S.J., Francisco. The Life and Martyrdom of the Venerable Father Diego Luis de San Vitores, S.J. (Guam: University of Guam, 2004) 168.
[9] Thompson, Laura Maud. The Native Culture of the Marianas Islands. (Honolulu: Bernice P. Bishop Museum, 1945) 11.

Figure 2 Ancient Chamorros, note their attire, 1602.[10]

leaf hats… and occasionally they protect their feet with sandals of palm leaf".[11]

The Ancient Chamorros have been described as hard workers, who have little regard for those that do not work. Everyone in the family participated in the daily tasks, including the young sons and daughters. The Ancient Chamorros were very obedient and experts in their occupations and skills, as a result of being taught at a young age with great love by their parents. They were also described as "naturally kind to one another", as they were very compassionate

[10] Carano, Paul. A Complete History of Guam. (Tokyo: Charles E. Tuttle Company, 1964) 84.
[11] Thompson, Laura Maud. The Native Culture of the Marianas Islands. (Honolulu: Bernice P. Bishop Museum, 1945) 10.

Figure 3 Ancient Chamorros performing their responsibilities.[12]

and assisted each other when necessary.[13] In any case a fisherman became ill and was therefore unable to fish, his son would go to the beach at the end of the fishing day and the other fishermen would share their catch. When someone of a house is ill, the relatives from the village will provide them with dinner and supper until they recover or pass away. The gracious quality of the people also extended to when it was time to repair or build a house. All the relatives and neighbors of the village assisted by gathering the necessary materials for construction. On the scheduled day, they will come together to construct the house, which will

[12] Carano, Paul. A Complete History of Guam. (Tokyo: Charles E. Tuttle Company, 1964) 85.
[13] Driver, Marjorie G. Fray Juan Pobre in the Marianas 1602. (Guam: Third Printing, 1993) 17.

take anywhere between half a day to three days. This act of kindness and support is something that is still alive in the Chamorros today. It is about this idea of helping one another.

Their Social Structure and Government of the Island

The social ranks were very important to the Ancient Chamorros. Unfortunately, similar to the other aspects of the Ancient Chamorros, little is known of their social structure. The available data does imply that the "society was organized into matrilineal clans".[14] Therefore, it was based on kinship with the female line of the family. As recorded by Louis de Freycinet, the people were divided into three social classes.

matua	Highest Class
atchaot	middle class
mangatchang	Lowest Class

The highest class was called *matua*, those who were the principal landowners that controlled a majority of the island's wealth. The class was comprised of "warriors, sailors, fishermen, professional canoe builders, and traders".[15] According to Father San Vitores , the highest ranking nobles or chiefs were called *chamorri*. Those in the middle class were called *atchaot*, who were typically family members of the *matua* and held the same social privileges. The members of the lowest class, *mangatchang*, were separated from society and lived a life as if

[14] Thompson, Laura Maud. The Native Culture of the Marianas Islands. (Honolulu: Bernice P. Bishop Museum, 1945) 11.
[15] Carano, Paul. "The Ancient Chamorros." Guam Recorder 1976: 7.

they were slaves. As implied by archeological evidence, those in the *manachang* class were of aborigine descendants of the Marianas Islands. Those that emigrated from Southeast Asia dominated the island and made the aborigine population the lowest class. This class group had a set of regulations to abide by, one being that they were only allowed to fish in the rivers, unlike the remanding population that fished in the ocean. They were prohibited from moving up to a higher class, however if a *matua* was guilty of certain offenses, they were "deprived of [their] property and lowered to the rank of *atchaot* for life or for a term and could be exiled from his district".[16] Fray Juan Pobre de Zamora had stated in 1602 that the *manachangs* inhabited the jungles and hills, while those that lived along the shore were of higher status. Respect was shown to an individual with *matua* ranking by lowering their head and not making any eye contact. They were prohibited to going in close proximity to a *matua* and instead were required to talk to them from a distance. It was considered a great courtesy to pass the hand over the breast of the host. Today, this custom has evolved and is called *manñgiñge*, which is when the guest smells the hand of the host. It was absolutely forbidden that the upper class people to marry a commoner. It was stated that the upper class parent would go as far as to kill their child who married below their class.

Social Position and Land System

Guam was organized into different districts that were comprised of one or two neighboring villages. Each district was governed under a leader, *maga*, who was the highest ranking male.

[16] Thompson, Laura Maud. The Native Culture of the Marianas Islands. (Honolulu: Bernice P. Bishop Museum, 1945) 14.

They called him *maga-lahe* and his wife was called *maga-haga*. The districts were "composed of a group of related nobles, their dependants from the commoner class, and their slaves".[17] The *maga-lahe* possessed great power and lived a privileged life style. He controlled many aspects of his district, including a majority, if not all, the land and fishing grounds. In addition, he was responsible for the manufacturing of shell "money", sailing canoes, and other privileges that continued to expand his wealth. Shell "money" were used for trading purposes between the Ancient Chamorros of Guam and others from the Marianas Islands, as well as with the Carolinians which took place before and after Guam's discovery by Magellan. At the time of death, the *maga-lahe* title would be inherited by the highest ranked male relative of the clan. Ranking in the clan was determined by seniority.

The village of Agaña was the principal village of the Marianas Islands at the end of the seventeenth century. Father San Vitores stated that the settlement in Agaña was the location of fifty-three upper class houses. In a separate quarter were approximately one hundred and fifty houses that were home to the lower class. It was here where the highest ranked Ancient Chamorros resided. The chiefs from Agaña were the most feared and respected by everyone on the island. While a strong unity existed between the people within the district, the desire for more power and respect lead to rivalries between districts. Not only were there rivalries between districts, but also between other islands in the Marianas Islands.

[17] Thompson, Laura Maud. The Native Culture of the Marianas Islands. (Honolulu: Bernice P. Bishop Museum, 1945) 12.

Their Diet

The diet of Ancient Chamorros consisted of the natural flora and fauna from the land and sea. As noted by W. R. Stafford, they would consume fish and some fowl. In support of the theory that the Ancient Chamorros migrated to Guam from Southeast Asia, plants that only derive from that part of the world were found on Guam. Some of the plants introduced to Guam by the migratory race was lemmai (breadfruit), suni (taro), fa'I (rice), tupu (sugarcane), mangga (mangoes), gaddo' (yam), and pugua (betel nut). The breadfruit trees were held in high regard, as they were eaten daily, used instead of bread. The breadfruit was dried and stored, the same practice done for the fish. The Ancient Chamorros were the only population in the Pacific Ocean that grew rice. After cultivating the rice, they would sell it, however it was considered a luxury and would save it for feasts. The only thing they would drink was fresh water, fermented beverages were not consumed. The cultural habit of chewing *pugua*, a narcotic betel nut wrapped in pepper leaf and lime, left their teeth discolored to a "shade varying from orange to blackish brown". [18] This social custom has survived to present day.

Caught in great quantities during season, fish was a major part of their diet. The men were great fishermen, which was a skill they acquired since childhood. Fray Juan Pobre wrote that at the tender age of four or five years young, Ancient Chamorro fathers would take their son out to sea on miniature canoes, *proas*, that were built especially for the sons and were identical to the men's *proas*. *Proas* were lightweight and small, qualities that made them capable of traveling great speeds. Fray Juan Pobre continues and states that as he witnessed, "by the time they are

[18] Leigh, R. W. Dental morphology and pathology of prehistorica Guam. (Honolulu: Bernice P. Bishop Museum, 1929) 139.

sixteen or eighteen, the sons put out to sea to fish alone…sets the sails, bails the boat, and fishes with nook and net".[19] Depending on the intended catch, the Ancient Chamorros would use a variety of baits. For instance, connected to their shell hooks, they would use coconut meat, shrimp or small fish which were used as baits for flying fish, *bolador 'gaga'*. The first flying fish is eaten raw, while the second is used as bait attached to a larger hook, which is used to catch larger fish such as *dorado 'botague'* (mahimahi) and *agujas paladares 'batto'* (blue marlin).

Their expert skills in the water were so impressive that the Europeans said that they were amphibious and some believe that the Ancient Chamorros are the most skilled deepwater fishermen. After a day of fishing, the fishermen head back to the shore, typically around 2:00 PM. At this time, the children from the village were waiting on the beach for their fathers return and pull the catch ashore after it is thrown in by their fathers. Four older sons assist by removing the *funei* from the water and transporting it to storage beneath a large boathouse, it is said that the boats were never left in the ocean overnight. Upon his return home, the fisherman spreads a clean woven mat at the cleanest spot adjacent to his house, where he lays fresh palm fronds. It is on the palms where the fisherman places his day's catch and uses a stone knife to cut them open. As a gift to the young children that assisted with carrying the catch home, the fisherman would distribute the blood, entrails, fat and intestines, to the children to eat as a treat. The neighbors also benefitted from the catch, as the fisherman cuts pieces from the fishes' back for them. Whatever parts that are remaining of the fish will be salted.

[19] Driver, Marjorie G. Fray Juan Pobre in the Marianas 1602. (Guam: Third Printing, 1993) 15.

A visitor to the island in 1588 named Cavendish, stated that the *proas* were between forty and fifty feet long and narrow. In contrast, Dampier, who arrived in the Marianas in 1686, described the *proas* to be twenty-six or twenty-eight feet in length, four to five feet wide and five feet in height.[20] Nearly a decade later, Gemelli Careri documented that they were fifteen and eighteen feet in length, three feet in width.[21] From this, one may concluded that it was possible that the Ancient Chamorros had three different types of *proas*, each used for specific purposes. For instance, the larger types would be used for voyages in the ocean, for fishing inside and outside the reef, while the smallest type would be used within a lagoon. Perhaps the smallest *proa* was the same one described by Gemelli Careri, which were the ones the sons of fishermen were trained on. There are many parts that comprise the *proas.* The outrigger, used to add weight to the windward side of the *proa* and keep it from capsizing, was composed of two bamboo poles that protruded out about six or seven feet. The sail is triangular in shape and is placed in a notch at the front of the *proa* and swings free at the rear next to the stern. Dampier used a half minute glass with sand to time the *proas*, which he estimated that they travel a speed of twelve miles per hour, and possibly double. The great speed that they traveled was documented by many other visitors to the island. As confirmed by both Fray Juan Pobre and Don Manuel de Leon (in 1668), the Ancient Chamorros decorated the *proas*, as well as their homes, with a mixture made from red soil, lime and coconut oil. It is said that when this mixture hardens, it becomes water resistant.

[20] McGrath S.J., Thomas B. "The Proas of the Marianas." Guam Recorder 1972: 49.
[21] McGrath S.J., Thomas B. "The Proas of the Marianas." Guam Recorder 1972: 50.

Their Living Remains

In everything that the Ancient Chamorros built or made, they utilized the material that was provided to them by nature. Prior to the Spanish discovering the island, they did not have any type of metal at their disposal. In addition to the vegetation, rocks and sea shells were important supplies used to make the necessary items, such as tools, weapons, fishing implements, bowls and even ornaments. They were extremely resourceful and would manipulate their tools in a manner that would allow it to be used for another function. These tools and other implements will be housed in CCRC and exhibited to visitors.

Based on the European accounts and archaeological evidence, the primary weapons used by the Ancient Chamorros were spears and *atupats* (slingstones). The spears were barbed and sharply pointed, with the tips made of fishbone or human bones. The spears were also used as fishing implements.

The Ancient Chamorros were extremely precise and skilled, and applied great force when slinging the *atupats*. It was documented that as a result of the Ancient Chamorros' strength, slingstones were found stuck in the trunks of coconut trees. The Ancient Chamorros made *atupats* from a variety of different types of material found on the island. Primarily, they were made of white limestone, however crystalline limestone and pottery were also used. They were also constructed from fine grain basalt and soft sedimentary green rock. In some cases, fossilized coral and marble were used. Typically, the Ancient Chamorros would use a red dye to coat the surface of many *atupats*. There are four different types of *atupats* that are classified based on their shape.

Figure 4 Different types of atupats (slingstones) made from a variety of materials. From the personal collection of Barbara and James Cushing.

Type A: Elongated with circular cross-section

Type B: Elongated with flattened cross-section

Type C: Double conical

Type D: Subspherical with tendency toward pointed extremities

Types A, C and D are found to be dominant in Guam, while Type B is essentially found in Rota, Tinian and Saipan. The geology of Guam corresponds to the types of *atupats* found in the different regions of the island. Type A *atupats* were commonly made of baked clay and soft sedimentary rock, in addition to basalt, which were rare. Although they are found throughout the island, a majority of this Type is found in the southern parts of the island. Limestone was used to make Type B *atupats*, which appear to be in the most natural state as compared to the other Types. Those made of limestone were mainly found in the northern parts of the island. Type C *atupats* are rare and comprised of different materials. They are primarily found along the coast of Guam in the west-central areas. Similar the Type C, Type D *atupats* are also rare and made from a variety of materials. As described by Fray Juan Pobre, at a very young age, children would be trained to use *atupats*, theirs were made of mud as they practice fighting one another. Although they may get hurt sometimes, once the fight had come to an end, "the two sides treat one another with great affection".[22]

Buried beneath the surface, *atupats* were found in caches, thought to be where the Ancient Chamorros stored their ammunition. Within the caches were a reserve of anywhere between

[22] Driver, Marjorie G. Fray Juan Pobre in the Marianas 1602. (Guam: Third Printing, 1993) 18.

"twelve to forty [*atupats*] of comparative uniformity in size, shape, color, material, and workmanship"[23]. Although most of the *atupats* found are scattered around the islands either on the surface or below grade, they were also found in burial caves.

It is suggested that *atupats* were not only used as weapons, but for a variety of other purposes. These *atupats* were typically larger in size and made with great workmanship with beautiful colors. The Ancient Chamorros modified *atupats* for the purpose of alternate functions, for instance those with smooth surfaces imply that they were used as a type of grinding tool. Other *atupats* were altered with "[grooves] lengthwise, highly colored and polished… [and] may have been used as ornaments, amulets, or as sinkers to attract fish".[24] Sinkers were also made by creating a vertical groove or perforated at one end of the *atupats*.

The Ancient Chamorros used different shells found in the ocean for a variety of purposes, although many were similar in form. The shells of giant clam, *Tridacna gigas*, were used as cutting implements such as adzes, as well as scrapers and spoons. The Ancient Chamorros also used other types of shells for cutting implements, such as *Terebra maculate, Pterocera bryonia and Cassis coruta*.

The adzes were made from thick shells and had a sharp edge, although varied in shape. Although there are numerous types of adzes, Laura Thompson had classified them under three major types.

Type A: Cylindrical or fusiform with circular cross-section

[23] Thompson, Laura Maud. Archaeology of the Marianas Islands. (Honolulu: The Museum, 1932) 49.
[24] Thompson, Laura Maud. Archaeology of the Marianas Islands. (Honolulu: The Museum, 1932) 51.

Type B: Triangular with elliptical cross-section

Type C: Rectangular with angular margins and plane surface

Figure 5 Adzes made from the shell of Tridacna gigas. From the personal collection of Barbara and James Cushing.

Type A adzes are circular, subcircular or subquadrilateral in cross-section. Most polls are rounded in the adzes that are not modified. The width and sharpness of the edges varies, either plane or arched. They were mainly made of igneous rock, primarily basalt and "are generally stout, thick, and strong enough to withstand heavy impacts".[25] As a result, they were probably used for rough carpentry, deep digging, gouging and grooving.

Although Type B adzes were also made of igneous rock, in contrast to Type A, they were flat, with cross-sections that are elliptical, ovate, or semicircular. There is a large range in size, and are rectangular to triangular shaped with flat or pointed polls. Generally, the edges are plane and slightly concaved. They were probably the tool used for surface finishing. In the case of both Type A and B adzes, it is believed that pecking was the process of creating the tools. However, the process of grinding and chipping was more evident in Type B. Adzes with angular margins and plane surfaces fall under the Type C category. They are subquadrangular cross-

section and broad, rectangular in plan, with sides and backs that are slightly convex and plane fronts. A unique quality of Type C adzes is that they were found to be made from a variety of materials, such as sandstone, limestone, basalt and calcareous mud. Unlike the previous Types of adzes, the grinding process was used to make Type C, which was well grounded and polished.

Although most of the artifacts that were studied by archeologists are no longer used on Guam, there are still a few ancient tools that are used today. An example are pounders. If they were now found in monument and cave sites, they were found hundreds of years later being used at the homes of the Ancient Chamorros descendants. Laura Thompson had classified pounders as Marianas, which were made from basalt and are short and thick with elliptical cross-section.

[25] Thompson, Laura Maud. Archaeology of the Marianas Islands. (Honolulu: The Museum, 1932) 35.

Other than the grinding on the surface of the base, which was probably caused by the use of the tool, pounders are roughly pecked.

Archeology findings prove that shells were used for other purposes other than as tools. Objects made from shell have been found at burial sites and were used as ornaments. There are the pieces made of "perforated disks of red *Spondylus* shell called *salapê*... several have been found at the heads of skeletons".[26] These types of ornament were found below the surface in monument and cave sites, and have been associated with burials. The ornaments were circular, while some were elliptically shaped, all which had holes.

Figure 6 Ancient Chamorro jewelry. From the personal collection of Barbara and James Cushing.

[26] Thompson, Laura Maud. Archaeology of the Marianas Islands. (Honolulu: The Museum, 1932) 56.

Also found a monument sites are crescent-shaped objects with perforated horns probably cut from *Tridacna*. These shell ornaments were used as necklace pendants or nose piercers, and possible as fishing sinkers used on the circular nets. *Guineha fumaguon* is chest ornament worn by men. It was a type of shell money, which had the highest value of any shell object used as money.

Chamorro Vernacular Architecture

Father San Vitores stated that the Ancient Chamorros lived scattered around the island, along the beach and on mountains. Archeological evidence proves this statement accurate, as the *latte* sites have been found along the coast and in the valleys of the mountains. The Ancient Chamorros lived in the most fertile areas of the island, which provided them with the natural food source they needed. Those that lived along the shore had available to them an abundance of fish, while those with houses inland had an abundance of agricultural produce. Father San Vitores found that the Ancient Chamorros lived in groups of fifty to a hundred along the shore, and six to twenty in the mountains. Their houses were divided into "four rooms… one serves as a sleeping room, another for storing produce, another as a kitchen and a fourth is large enough to hold and store boats".[27] The young unmarried men lived in a separate dwelling, which they share with unmarried women. It is believed that this structure also doubled as a large club house that was the center of the village life.

[27] Garcia S.J., Francisco. The Life and Martyrdom of the Venerable Father Diego Luis de San Vitores, S.J. (Guam: University of Guam, 2004) 168.

Latte stones are unique to the Marianas Islands and therefore it is believed that the Ancient Chamorros were the inventors of this great masterpiece. They were the only ancient race in the Pacific Ocean that used stone to elevate their buildings above the earth's surface. Although they were highly skilled as stoneworkers and masons, demonstrated in their chisels, spearheads, *atupats*, etc. their most magnificent stone work is revealed in the *latte* stone sites. There is still no full understanding of these structures, as with many questions are left unanswered. The origin and use of the original design remains unknown. Although it is believed that the island became inhabited in 1527 B.C., the *latte* structures only date back to A.D. 1200.

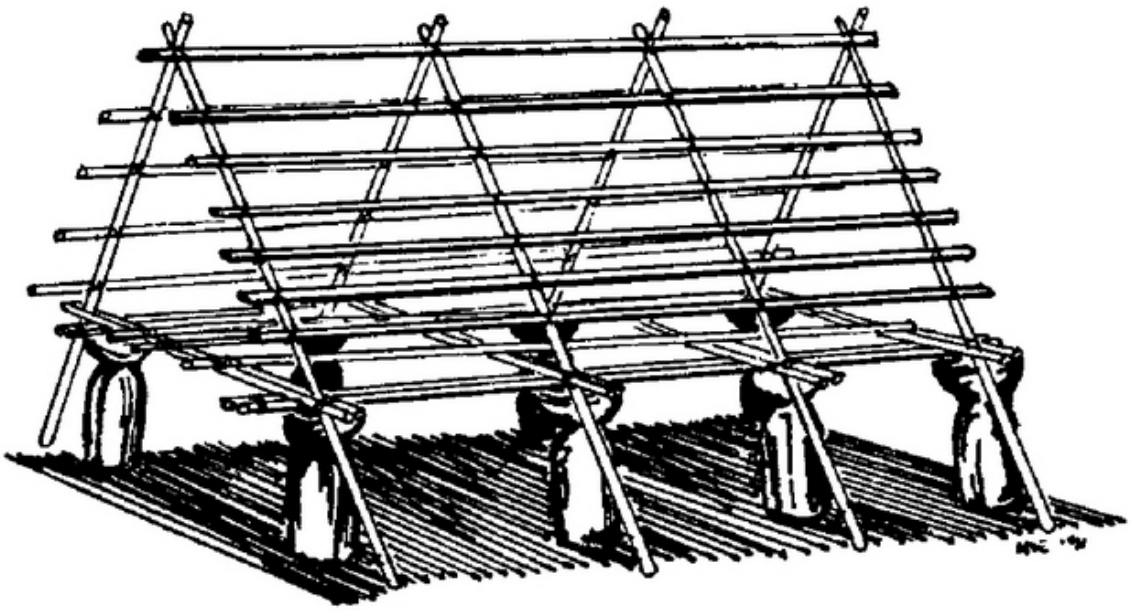
Latte stone sites are found scattered around the island, with the *latte* organized in two parallel rows, in the form of a rectangular plan. It has been found that the *latte* sites were arranged to include a range between six to fourteen *lattes*. The later was found in the interior of the

Figure 7 Latte site at Gun Beach in the central village of Tumon.[28]

[28] Sanchez, Pedro C. Guahan Guam The History of our Island. (Agana: Sanchez Publishing House, 1985) 18.

southern village of Inarajan, next to the Inarajan Falls. Typically, the structures were made with eight to ten *lattes*, which reach an estimated height of thirty-three to forty feet.[29] The *lattes* are comprised of two parts: the base which is called *halege* and the cap called *tasa*. Depending on the surrounding geology, the materials used varied. *Tasas*, placed on top of the *haleges*, were made of coral heads or basalt. The *haleges* were arranged upright and were made from carefully cut limestone from the earth using adzes. It is believed that the *haleges* were sometimes mass-produced from a location that was a distance from the intended site they were to be placed. Once the *haleges* were isolated, they could be moved to location.

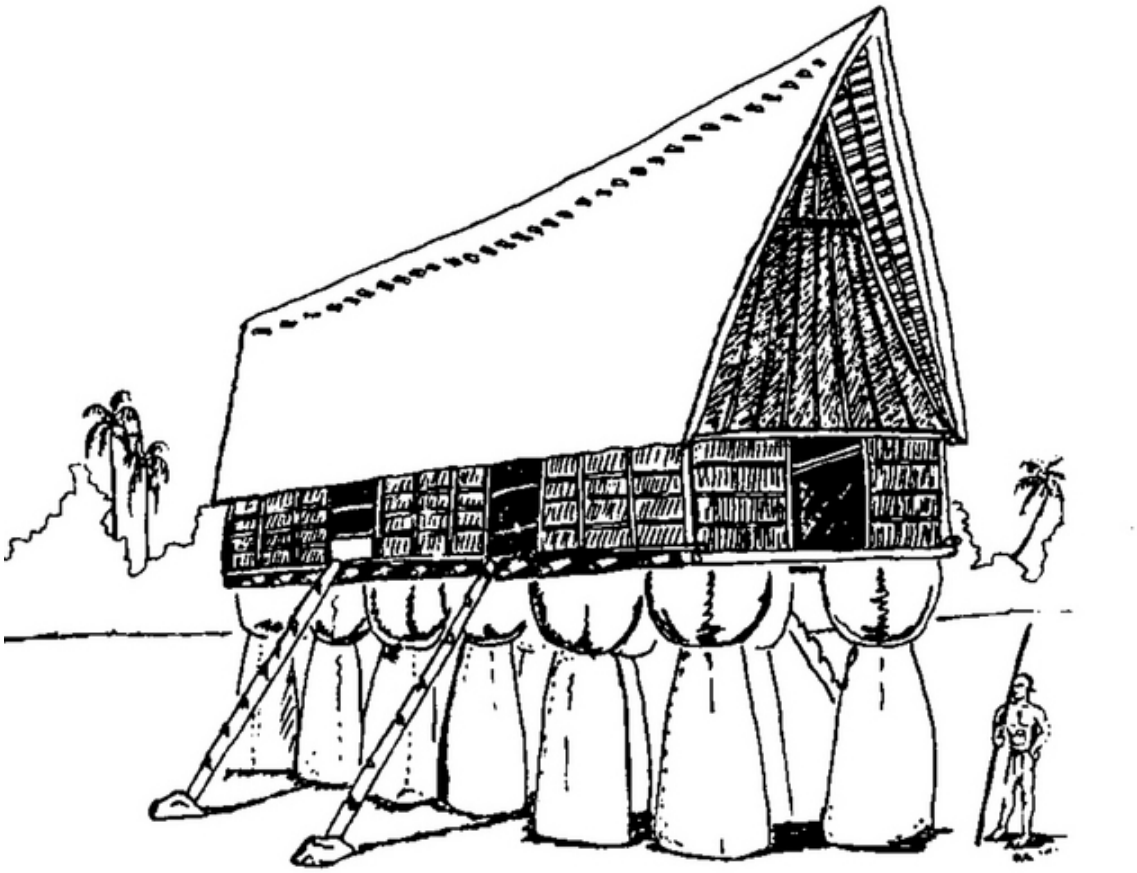
Figure 8 Latte stone house with A-frame structure exposed.[30]



[29] Ruth, H. Mark, Jones, Jack B., Grobins, Morris G. Guidebook to the Architecture of Guam. (Taipei: The Institute, 1977) 12.
[30] Guampedia. 2008. 28 April 2009 http://www.guampedia.com/.

The *latte* stones are between 68 – 73 inches in height, of which 32 inches were securely buried below grade.[31] Possibly due to the maximum span of the materials used to construct the structures that rested on the *lattes*, it is documented that the spacing between *lattes* is approximately ten feet. The structures were generally oriented parallel or perpendicular to natural features, such as a cliff line, beach or stream.

Figure 9 Artist drawing of latte house.[32]



Above the latte stones stood A-framed structures that provided shelter for those inside. Once

[31] Thompson, Laura Maud. Archaeology of the Marianas Islands. (Honolulu: The Museum, 1932) 8.
[32] Guampedia. 2008. 28 April 2009 http://www.guampedia.com/.

the *latte* stones were in place, sennit was used to lash timber to form the A-frame structure. The lashings were made from coconut fibers or wild hibiscus bark. There were three types of wood used for the poles: coconut, hardwood and bamboo. On top of the frame, coconut leaves were woven and applied forming a thatched roof. In some cases, nipa and swordgrass were sewed onto bamboo strips for thatch. Mats were used as doors and walls, and covered the bamboo flooring.

There are several explanations behind the design of these built structures. The use of stone was probably used for its longevity and durable, as evident in their existence till today. Guam's close location to the equator and its tropical climate, required a comfortable living environment, the structures had to address the heat issue. As a result, elevating the structures off the ground and situating them on top of the *lattes* allows for an increase in ventilation. The air is allowed to move freely between the grade and finish floor. In addition, the elevated aspect of the structures provided a type of security. There are skeletal remains found amongst the *latte* sites, which suggest that the Ancient Chamorros participated in some form of ancestor worship.

POST-CONTACT

Although the design of the Center is focused on the Pre-Contact period of Guam, the Post-Contact period will also have a place at the Center. The intention is to provide a snapshot of the chain of events that occurred after the first European settlers stepped foot on Guam. The idea is to present a complete picture of how Guam began with the Ancient Chamorros and the following events that drastically changed the history of the island. The history of Guam following the 1521 discovery by Magellan will be mapped out at the Center in a timeline hall, while the concentration will be of the Pre-Contact period. Regarding the research aspect, the Center will also house resources that documented the Post-Contact period in its Research facility, which the collection will be available for the use by the public.

SPANISH PERIOD

Following the Dark Ages, the Renaissance period brought wealth and power to cities and nations in Europe. The desire for more lead to the start of international trade and eventually to the geographical discoveries of other parts of the world by explorers such as Marco Polo, Christopher Columbus and Ferdinand Magellan. The Portuguese born, Magellan, was employed by the Spanish crown, King Charles I, to discover a new path to the East. On September 20, 1519, Magellan with his fleet of 237 men and four ships, the *Concepción*, the *Victoria*, the *San Antonio* and the *Trinidad*, set sail to the Southwest. It was not until November 28, 1520 and three ships later (*San Antonio* returned back to Spain) when Magellan's fleet entered the Pacific Ocean and three months later anchored at Guam on March 6, 1521.[33] However, some sources state that the first island that they landed on may not have been Guam, instead possibly Tinian or Saipan. Their initial stay was rather short, only lasting three days during which they stocked their ships with fresh food and water. Prior to departing to continue their voyage west, Magellan accused the Chamorros of stealing one of his ship's boats. This incident lead him to name the island as *Isla de los Ladrones*, translated to Island of Thieves.

1521-1668

The years following Magellan's departure included the occasional short visits by Europeans, however Guam remained isolated for about a century and a half. Spanish and Dutch explores,

[33] Carano, Paul. A Complete History of Guam. (Tokyo: Charles E. Tuttle Company, 1964) 40.

as well as English pirates would stop at the island, most would only stay during the duration of a few days. Due to its geographic location, Guam played an important role during the Spanish colonization period. It's source of fresh water and food made it a regular stopping point for the Spanish galleons on their annual voyages from Mexico to Manila.

Philip II of Spain sent orders to explore the western islands toward the Moluccas and Miguel López de Legazpi was appointed the expedition's leader. Legazpi and his crew departed from Natividad, Mexico, and reached Guam on January 22, 1565.[34] Four days later on the 26th, Guam formally became the possession of Spain, making it a part of the Spanish colonial system. The Chamorros were in one way or another impacted by the laws of the Indies, making them subject to the king of Spain.

In addition to it's strategic location for the purpose of restocking Spanish ships with fresh water and food, another reason for the Spanish colonization to spread Christianity. San Vitores was one of the first missionaries that went to Guam. In 1662, the galleon *San Damian* was headed to the Philippines with Jesuit missionaries and stopped briefly on Guam for supplies.[35] San Vitores was touched by the Chamorros and wanted to travel back to Guam and spread Christianity among her people. He requested to Queen Mariana, the then widow of King Philip IV, for permission to conduct this duty and establish a mission on Guam. With her approval, he sailed from Manila in August 1667 and arrived on Guam on June 15, 1668 and established the first permanent white settlement.[36]

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[34] Bearsley, Charles. Guam Past and Present. (Tokyo: Charles E. Tuttle Company, 1964) 112.
[35] Carano, Paul. A Complete History of Guam. (Tokyo: Charles E. Tuttle Company, 1964) 62.
[36] Carano, Paul. A Complete History of Guam. (Tokyo: Charles E. Tuttle Company, 1964) 65.

Colonization

It was not until 1668 when the Spanish government began to take the first steps towards colonizing the Marianas Islands. It is one of the most important periods in Chamorro history and brought great change to the islands. San Vitores and his missionaries were the first Europeans to treat the Chamorros with kindness. The Chamorros in return were friendly towards the missionaries. The chief of Agaña*, Quipuha,* extended their welcome by offering San Vitores a parcel of land in Agaña for a church. Impressed by his act of kindness, San Vitores believed that the *Isla de los Ladrones* name was not appropriate, and instead named the island chain as the Marianas Islands in honor of Queen Mariana.

The beginning of the mission was successful, however a chain of events soon followed that resulted in the change in attitude towards the missionaries. It began when the Chamorros in the *matua* class did not want those in the *manachang* class to be baptized. The missionaries however went against their wishes and continued to baptize the Chamorros and spread Christianity. The situation following *Quipuha's* death did not help. With the construction of the first church, *Dulce Nombre de María*, completed San Vitores believed that it would be a good opportunity to start the Christian burial tradition. San Vitores insisted that *Quipuha*'s funeral follow the Christian tradition with services in the church and bury him in the ground. The Chamorros did not like this idea and wanted to follow their traditions and lay their chief in the cave as his ancestors were. Despite the wishes of the Chamorros, San Vitores proceeded with a Christian service, angering the Chamorros.

The final event that changed the relationship between the Chamorros and missionaries came on

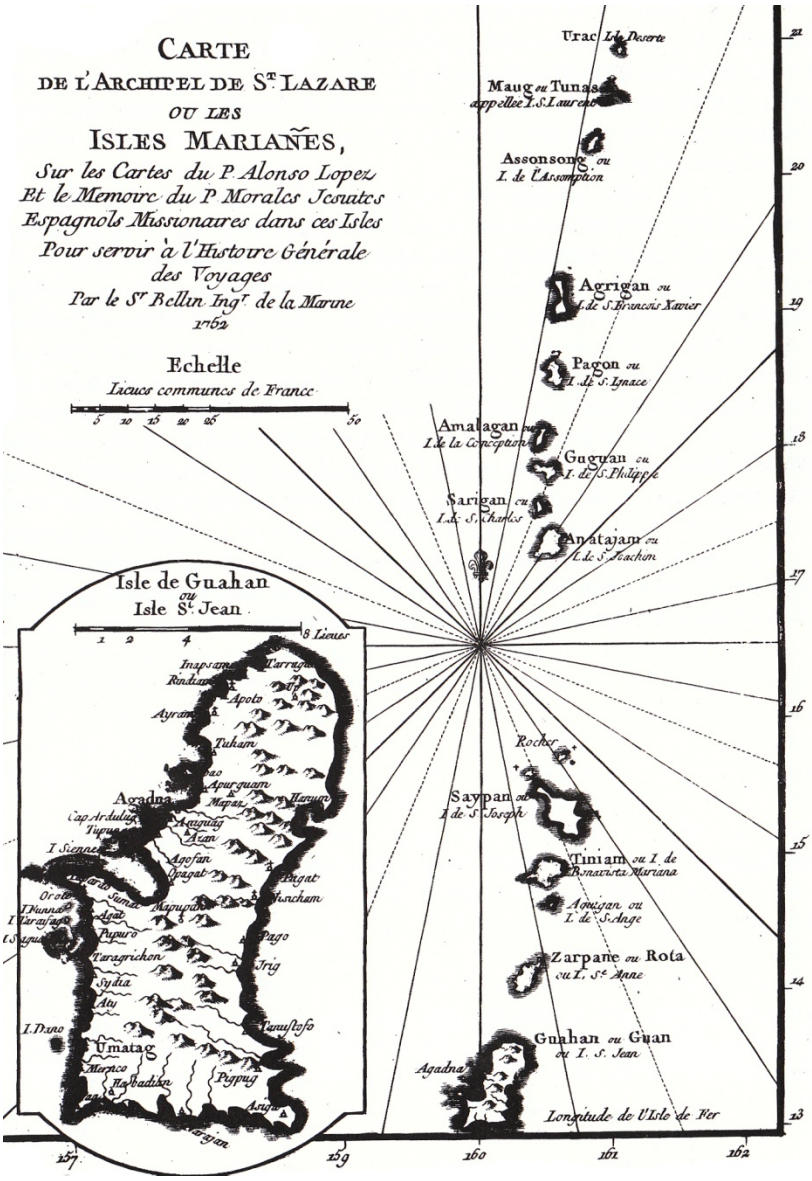
Figure 10 Portrait of San Vitores.[37]

April 2, 1672.[38] San Vitores traveled to the village of Tumon, where he was planning to baptize the daughter of the village's chief, *Matapang*. *Matapang* refused and warned San Vitores to leave or he would kill him. San Vitores, not feeling threatened, went against the chief's wishes and baptized the daughter, an angry *Matapang* and villagers attacked the missionaries, killing San Vitores and his assistant. The death of San Vitores lead to the Spanish military taking control over the island and the start of the Spanish-Chamorro Wars. Captain Damian de Esplaña

[37] Hezel, Francis X. From Conquest to Colonization Spain in the Mariana Isalands 1690 to 1740. (Saipan: CNMI Division of Historic Preservation, 2000) 2.
[38] Carano, Paul. A Complete History of Guam. (Tokyo: Charles E. Tuttle Company, 1964) 71.

arrived on Guam on June 16, 1674 and took command of the military garrison to create order.[39] In 1680, Captain José de Quiroga was brought to Guam, upon his arrival, the Chamorro resistance on Guam ended and the Spanish spent the following years stopping small groups of

Figure 11 Map of the Mariana Islands during the late 1600s.[40]



[39] Carano, Paul. A Complete History of Guam. (Tokyo: Charles E. Tuttle Company, 1964) 74.
[40] Hezel, Francis X. From Conquest to Colonization Spain in the Mariana Isalands 1690 to 1740. (Saipan: CNMI Division of Historic Preservation, 2000) 3.

resistance. In 1691, an expedition began to spread the Christian faith to the Chamorros that inhabited the northern Mariana Islands, known as *Gani*.[41] The northern Chamorros were forced to relocate to the island of Guam would be Christianized and lived the village life. When the reduction of *Gani* was complete, the entire population of the Mariana Islands was concentrated on Guam, Rota and Saipan.

Village Life

With the Spanish colonization, Christianity began to replace the Chamorro traditions and culture. The Chamorro beliefs based on myths, superstitions and ancestor worship was replaced by Christianity. In order to organize and manage the island, Guam was divided into five districts, *partidos*, which was governed by officers called *alcaldes-mayor*. Each district included a settlement forming a village, or pueblo. In 1690, the village population ranged from 200 to 300 people.[42] The second rank was the *sargento-mayor* and the highest official was the governor, both lived in Agaña, whose organization was different to that of other parts of the island. Since the time of Ancient Chamorros, Agaña has been the political and cultural center of Guam. During the Spanish period, it was no different. Agaña was designed after a Spanish provincial capital and was organized under the *barrio* system, where a church or chapel was surrounded by

[41] Hezel, Francis X. from Conquest to Colonization Spain in the Mariana Islands 1690 to 1740. (Saipan: CNMI Division of Historic Preservation, 2000) 6.
[42] Hezel, Francis X. from Conquest to Colonization Spain in the Mariana Islands 1690 to 1740. (Saipan: CNMI Division of Historic Preservation, 2000) 15.

a group of houses. The buildings were constructed of wood, however after two typhoons during the 1690s, the damage that was sustained forced them to use more durable materials.[43]

Christianity was the reason for establishing Spanish rule over the Mariana Islands and hence maintained its importance, with its church at the center of the village life. The Jesuits ran the formal education programs. The boys attended *Colegio de San Juan de Letran*, which was started by San Vitores, while the girls went to *Escuela de las Ninas*.

As the Ancient Chamorros, the Chamorros during the Spanish period continued to support themselves by farming and fishing. On the farm, they would grow rice and cultivate taro, in addition to raising chickens, pigs and cows. They would use their products to trade with the ships for clothing and other household necessities, including iron cooking implements and metal tools. It was during this time when tobacco became widely used by the local population.

End of the Spanish Rule

During the nineteenth century, there was a shortage of natural resources on Guam. Natural disasters caused the population to be on the verge of starvation and Guam's economy was weakening. It was during this time when scientists, voyagers, whalers and ships from numerous nations visited the island.

[43] Hezel, Francis X. from Conquest to Colonization Spain in the Mariana Islands 1690 to 1740. (Saipan: CNMI Division of Historic Preservation, 2000) 15.

After over three hundred years under the Spanish crown, the control of Guam was turned over to the United States. It started across the Pacific Ocean, in 1895 when Cuba rebelled against the Spanish that ruled the country for almost four hundred years.[44] The Spanish resorted to brutality to suppress the rebellion. Accounts of the harsh treatment were published in United States' newspapers, resulted in the American people demanding that their government intervene. It was not until February 15, 1898 when America stepped in, after their battleship Maine was blown up in Havana harbor and Congress declared war with Spain on April 25th, known as the Spanish-American War.[45] The three month war came to an end with the Treaty of Paris that was signed between the two countries on December 10, 1898.[46] The Treaty resulted with the United States as a protectorate over Cuba, while the Philippines, Puerto Rico and Guam were ceded to them.

AMERICAN PERIOD

Acting Governors

During the transition period when Guam changed hands from Spain to the United States, there were several governors that controlled the island. At the beginning, there was a

[44] Carano, Paul. A Complete History of Guam. (Tokyo: Charles E. Tuttle Company, 1964) 169.
[45] Carano, Paul. A Complete History of Guam. (Tokyo: Charles E. Tuttle Company, 1964) 170.
[46] Bearsley, Charles. Guam Past and Present. (Tokyo: Charles E. Tuttle Company, 1964) 194.

misunderstanding and two men claimed the right to act as governor. An American citizen, Francisco Portusach, was the first to claim the position, as did José Sisto, the only Spanish official permitted to remain on the island. The issue was resolved on January 1, 1899 when the collier Brutus arrived on the island and Lieutenant Vincendon Cottman appointed Sisto as governor until everything was finalized with the Treaty.[47] When the ownership of Guam was settled, Commander Edward Taussig was assigned to go to the island and ordered Sisto to hand over control of the island to Guamanian Don Joaquín Pérez.

Naval Government

After Guam was ceded, the governing of the island became a concern for the United States. As a result, President William McKinley ordered the navy to travel to Guam, take the Spanish as prisoners of war and occupy the island and establish the United States Naval Government. The United States Naval Era began and Navy Captain Richard Phillips Leary, who arrived on Guam on August 7, 1899, was appointed as the first Naval Governor of Guam.[48] Through the four decades of Navy Administration, many changes to the island occurred.

To assist the local population, Governor Leary's successor, Governor Seaton Schroeder had informed the United States government of the hardships that the Chamorros were experiencing, such as shortness of food and poor health care. At the request of Governor Schroeder, Guam's

[47] Carano, Paul. A Complete History of Guam. (Tokyo: Charles E. Tuttle Company, 1964) 178.
[48] Sanchez, Pedro C. Guahan Guam The History of Our Island. (Agana: Sanchez Publishing House, 1985) 79.

first hospital was built in June 10, 1901.[49] It was during Governor Schroeder's office when the request for American citizenship was brought up. After forwarding such request to Washington, it was turned down. Once again, the citizenship bill was brought to Congress, however failed to pass again due to the strong opposition from the Navy Department. As a result, the Chamorros held mixed feelings about American citizenship. Most of the people of Guam wanted the Navy to remain as administrator of the island, even after American citizenship was obtained.

Guam and World War II

Guam is best known in history for its involvement with World War Two. The Chamorros and American Navy alike were unprepared for the Japanese invasion. When the first Japanese planes appeared over the island in the spring of 1941, defense projects were still in early stages.[50] In trying to prevent war, the Japanese Ambassador Saburo Karuso traveled to Washington for negotiations, however the whole world was unaware that the Japanese Navy was already in route to its sneak attack on Pearl Harbor. On December 7, 1941, Japan bombed Pearl Harbor, the following day, the first bombs were dropped on Guam in Sumay. Early morning on January 10th, the Japanese had captured the village of Agaña, forcing Governor McMillin to surrender his military command and responsibility over the people of Guam.

[49] Sanchez, Pedro C. Guahan Guam The History of Our Island. (Agana: Sanchez Publishing House, 1985) 79.
[50] Sanchez, Pedro C. Guahan Guam The History of Our Island. (Agana: Sanchez Publishing House, 1985) 174

JAPANESE OCCUPATION

The Americans on Guam were treated by the Japanese with no regard to the international rules and regulations governing the conduct and care of prisoners of war, nor were they even treated with decency as humans. Shortly after the invasion, the Americans were shipped to Japan to prison camps. The Chamorros were no different to the Americans and were also brutally treated. The Japanese changed the name of Guam to *Omiyajima*, which translated to the Great Shrine Island, and also changed the names of the villages.[51]

The first order of business was the segregation of the Chamorros and American military, which was done by the issuing of passes to the Chamorros. It was a piece of cloth used to identify the native people, which had to be worn at all times. The last units of the Japanese army departed from Guam in March 1942, after which the island was turned over to a navy unit, *kei.bitai*, who had ultimate responsibility over the entire island.[52] The civilian authorities, *minseibu*, were responsible for the day to day administration and control of civilian matters. During the first year and a half under the navy, the Japanese left the local population to be as they pleased.

[51] Carano, Paul. A Complete History of Guam. (Tokyo: Charles E. Tuttle Company, 1964) 273.
[52] Sanchez, Pedro C. Guahan Guam The History of Our Island. (Agana: Sanchez Publishing House, 1985) 192.

Brutality towards the Chamorros

Gradually, the Japanese enforced their methods upon the Chamorros. English was no longer allowed in schools, and instead Japanese was required. As punishment to one individual, the communities' supplies were cut off. In addition, food rationing was also enforced.

The final period of the Japanese occupation was known as the *kaikontai*. Early in 1944, the *kaikontai*, agricultural group, arrived on Guam to provide food for the Japanese army that was expected to reach Guam. Schools were closed and the Chamorros, young and old, men and women, were required to work the fields. As the Chamorros spent their days assisting the Japanese, many were unable to maintain their farms and food became even scarcer. Only a few supplies would come from Japan, however it was only intended for the Japanese. In the cases when the supplies did not arrive, the Japanese confiscated the limited crops the Chamorros had for their families. Under great pressure from the Japanese government to provide sufficient food supply, the *kaikontai* resorted to brutality towards the Chamorros.

American Campaign

The first sign of the United States recapturing Guam came on February 23, 1944 with the first air raid that bombed a Japanese airstrip.[53] To vigorously prepare for war, the Japanese drafted the Chamorros to strengthen their defense. The work included the paving of roads, the digging of shelters for protection from air raids and the construction of pillboxes that were located along

[53] Carano, Paul. A Complete History of Guam. (Tokyo: Charles E. Tuttle Company, 1964) 290.

the beach and other parts of the island. After the preliminary attacks, the people were transported to concentration camps. The reasons for the relocation is unknown, some believed that it was the Japanese's intention to slaughter the entire island's population, while others believed that it may have been because the Chamorros could have assisted the Americans. However, it ended up that the concentration camps helped save many lives from the American air raids.

About five months after the first air raids, on July 21, 1944, the American forces positioned themselves on Guam to prepare for their invasion.[54] Considered one of the best planned and

Figure 12 The village of Agaña in 1944 after America bombed it during their efforts to recapturing the island.[55]

executed campaigns during WWII, the Americans' attack came from two directions. The first group of troops came from the south in Asan and Agat. The second was the northern invasion, all which came to an end on August 12th, 1944 with the reclaiming of Guam by the United States.

[54] Sanchez, Pedro C. Guahan Guam The History of Our Island. (Agana: Sanchez Publishing House, 1985) 232.
[55] Sanchez, Pedro C. Guahan Guam The History of our Island. (Agana: Sanchez Publishing House, 1985). 231.

Within a few months following the liberation, Guam became America's largest forward base in the Pacific.[56]

Figure 13 After Guam was recaptured in 1944, it became America's largest base in the Pacific Ocean.[57]

[56] Sanchez, Pedro C. Guahan Guam The History of Our Island. (Agana: Sanchez Publishing House, 1985) 252.
[57] Sanchez, Pedro C. Guahan Guam The History of our Island. (Agana: Sanchez Publishing House, 1985). 252.

POST WAR

Following the war, drastic changes began to reshape Guam in efforts to restore the island. Guam's strategic location in the Pacific kept the attention of the American government. The airfields around the island were made operable in preparation for future attacks. The Navy also rebuilt and expanded Apra Harbor port at the southern part of the island. The channels were dredge to accommodate the large ships that seek shelter in its waters. Bulldozers cleared jungles and villages left in ruins from the war. Millions of dollars were poured into the island for new roads, public schools, a hospital and other government buildings that were constructed. Guam was unrecognizable. These improvements required the recruitment of outside construction workers to assist in this rapid development, something that would replay some sixty years later.

After years under the Navy, the United States relinquished control over the island to a civilian run democracy government. This new status of self-governing was the result of the Organic Act in 1950 signed by President Truman.[58] The Act made Guam an unincorporated territory of the United States and the Guamanians acquired American citizenship.

[58] Bearsley, Charles. Guam Past and Present. (Tokyo: Charles E. Tuttle Company, 1964) 238.

GUAM TODAY

Today, Guam is about to take part in the largest military buildup since World War II. Billions of dollars is being invested for the defense buildup that will begin in 2010 on the island and in the Commonwealth of the Northern Mariana Islands (CNMI). The changes that result from this buildup will bring great economic benefit to the island, however it will also strain the culture and heritage of the Chamorros. There has to be a balance and unless this is maintained, Guam may be embarking on a modern day threat to her identity. For this, the need of a Chamorro Cultural and Research Center is even more necessary to help maintain and celebrate the history of the indigenous people of Guam.

There are three major components that comprise the buildup: the Marine Corps, Navy and Army. In addition to the development and construction of facilities and infrastructure, there are an estimated 8,600 Marines and their 9,000 dependents that are being relocated from Okinawa Japan to Guam. In addition, approximately 600 military personnel and their 900 dependents will be relocating to establish and operate the United States Army Air and Missile Defense Task Force.[59] There will also be improvements made to Apra Harbor to support a nuclear powered aircraft carrier. This is not the only increase in population, the Environmental Impact Statement/Overseas Environmental Impact Statement states that there will also be transient Military personnel and Department of Defense civilian workforce from off island that will increase the island's population. In total, the estimated population increase on Guam from off-

[59] "Guam and CNMI Miliary Relocation." Draft Enviornmental Impact Statement/Overseas Enviornmental Impact Statement Executive Summary. (2009) ES-1.

island will be 33,608 in the year 2020. However, during the peak of the relocation in 2014, there will be an estimated population increase of 79,178 people from off-island.[60] That is almost a 50% increase of today's current population.

The defense buildup will bring a wealth of opportunity to both the local and off-island population, in addition to strengthen the economy of the island that primarily revolves around tourism. However, as previously mentioned, it will also bring great strain to the island on many different levels. The only question remains, is it worth it?

[60] "Guam and CNMI Miliary Relocation." Draft Enviornmental Impact Statement/Overseas Enviornmental Impact Statement Executive Summary. (2009) ES-7.

CASE STUDIES

As expressed in its name, the CCRC is focused on the cultural and research aspects of the Chamorros of Guam, therefore it is important to investigate similar building types that capture and celebrate the way of life of other indigenous people. The Case Study research will offer valuable information to identify the positive and negative qualities of such buildings and incorporate it in a way that will make the Center a success. It is a method of learning and understanding the process of the design teams on how they derived at the final design. This portion of the research will help to focus the purpose of the Center and organize it into a well thought out program. The Case Studies includes research of New Caledonia's Kanak people in the Jean-Marie Tjibaou Cultural Center, the Māori of New Zealand in the Museum of New Zealand Te Papa Tongarewa, and the Native Americans of the Western Hemisphere in the National Museum of the American Indian.

JEAN-MARIE TJIBAOU CULTURAL CENTER

Figure 14 View of the Center from lagoon.[61]

Nouméa, New Caledonia

1991-1998

81,000 square feet

$90 million

Renzo Piano, the renowned architect of the Jean-Marie Tjibaou Cultural Center, carefully thought out every detail for the design for this project. He wanted to create a design that respectfully represents the Kanak people, their beliefs and traditions. As a result, the Center "created an inhabitable bridge to the 21st century that embodies past, present and future", while preserving the Kanak culture.[62] Piano's great knowledge of material, construction and art helped to create a unique complex that successfully displayed historical and cultural metaphors, as well as literary and art references. Through its form and function, the Center is an expression that celebrates the appreciation of this indigenous culture alive today.

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[61] Renzo Piano Building Workshop. March 2009 http://rpbw.r.ui-pro.com/.
[62] Wines, James. Green Architecture. (Hong Kong: Taschen, 2000) 126.

New Caledonia

New Caledonia is a French territory made up of a series of islands located at the western edge of Oceania where the indigenous Kanak people still live. It is located east of Australia and north of New Zealand, in southern Melanesia at latitude of 19° - 23° south and at a longitude of 158° - 172° east. It is the third largest island series in the Pacific Region after Papua New Guinea. The nation is greatly diverse with 27 distinct languages. The mainland is divided lengthwise by the natural topography of the range of mountains, Chaîne Centrale. The east coast is humid and open to the trade winds, with land covered with lush tropical vegetation, green valleys, waterfalls and rivers. The west coast is a drier temperate zone, with fewer coconut trees and the land is used for grazing cattle. New Caledonia's vegetation is similar to that of Australia, as oppose to other islands that are in closer proximity. Seventy-five percent of the 3,230 botanic species are endemic. The islands have areas of mangrove swamp and savanna grassland along the west coast. There are also a large number of protected lagoons with an average of 20 meters, the largest lagoon complex in the world. The territory's most distinctive tree is a pine known as the *Araucaria columnaris*. With the only native mammals being the flying fox, bat and rat, the extreme richness of life on the reefs makes up for the lack of variety on land. New Caledonia's 1,600 km of barrier reefs are home to 350 species of coral, 1,500 species of fish and 20,000 species of invertebrates. In 1774, Captain James Cook first arrived in New Caledonia, during which the islanders turned hostile when they introduced diseases, took away their ancestral lands, desecrated sacred sites and destructed cultural artifacts and traditions. In 1853, the group of islands became known as the French colony of New Caledonia. As a result of Matignon Accord, the break out of violence almost caused a civil war in 1988. On April 21, 1998,

an agreement was announced in New Caledonia, which gave the territory greater autonomy. As a result, the territory has its own government.

In the Kanak culture, dance has developed into a high art form. Traditional dances tell the stories of births, marriages, cyclones or preparations for battles. However, in 1952, colonial authorities banned high-energy and trance-like dances. Music is a fundamental element of every traditional ceremony, ranging with instruments such as conch shells, rhythm instruments and bamboo flutes. New Caledonia's traditional staples are fish, coconut, banana, taro, sweet potato and yam.

History of the Center

Jean-Marie Tjibaou Cultural Center sits on the outskirts of Nouméa, New Caledonia's capital city with a population of 70,000 people. It occupies the Tima Peninsula, a 20-acre nature reserve that acts as a barrier, protecting a placid lagoon from the winds and waves of the ocean. The Center was financed by the French government, costing a total of $90 million.[63] Although not intended to be a national monument, the Center symbolizes the recognition and the existence of the Kanak people… designed to be a place for the celebration of that culture".[64] In addition, it is a tribute to the memory of Jean-Marie Tjibaou, the assassinated president of the New Caledonian provisional government, was determined to emphasize the Kanak culture.

[63] Message, Kylie. New Museums and the Making of Culture. (Oxford: Berg, 2006) 155.
[64] Togna,Octave. Tjibaou Cultural Centre. (Noumea: ADCK, 1998) 9.

Figure 15 Aerial image showing the Center on the Tima Peninsular.[65]

A statue of Tjibaou gazes down on the complex from a hill near the site. The Center had a set of four objectives, to promote and preserve the Kanak archeological and linguistic heritage, to encourage contemporary modes of expression within the Kanak culture, to promote cultural exchanges, and to identify and carry out research programs. Piano's strikingly photogenic design was selected during an international competition in 1991. "The two-staged international competition was launched to find an architect for a building that would reflect the complexity of Kanak rituals and customs, its… languages and, most importantly, its desire for independence".[66] The Center reflects Piano's sensitivity to the regional environment, as it celebrates the multiple layers of Melanesian culture.

[65] Renzo Piano Building Workshop. March 2009 http://rpbw.r.ui-pro.com/.
[66] Richardson, Vicky. New Vernacular Architecture. (London: Laurence King Publishing, 2001) 132.

Design Approach

Piano's challenge in designing the project was paying homage to a culture and respecting its traditions and history. It was difficult to create a large institute to welcome the nonurbanized Kanak people. Therefore, Piano used European technology to help create the traditions and expectations of the Kanak people. He wanted to reflect the indigenous culture and its symbols, instead of creating a historical reconstitution or a replica of a village. Understanding the development of Kanak culture was very important in the design approach of the project. In order to create a Center for the local people, Piano, a foreigner, had to become familiar with Kanak history, environment and beliefs. To create such a powerful and meaningful structure, he wanted to reflect on the natural elements, such as wind, light, vegetation and topography which is uniquely identified with the New Caledonia landscape. Piano, who was impressed with his Kanak clients, responded to their wisdom and created original and symbolic forms that reflect the local tradition. He did this through the integration of regional materials, traditional construction methods, contemporary technology and ecological design. Piano created a great sensitivity to the site and increased the use of terrestrial materials and vegetation. The views and easy access to the landscape, along with natural ventilation, keeps visitors in contact with the outdoors. From the perspective of green design and climate control, Piano utilized weatherproof bamboo, which is the world's most easily erected and rapidly regenerated raw material. He used it for the vertical elements that capture and control wind through adjustable ventilators. The project addresses the exploitation of air currents and the difficulties of finding a way of expressing the tradition of the Pacific in modern language. The horizontal battens are denser at the middle than at the top, to enhance the draft between inner and outer layers of the

walls. Bamboo renders the building infinitely renewable and establishes a consensus imagery that fits into the culture. Cross pieces between wall posts and rafters support the deep exterior thatch. The interiors are left unfinished. A double skin system is supported by double rows of ribs, which allow the curved exterior batten wall to shade the vertical interior wall with space for a thermal chimney in between. Designed for high winds, the tall sides create a natural ventilation. In order to withstand hurricanes, Piano used galvanized steel connectors to brace the glue-laminated iroko (an African wood), forming three-dimensional circular trusses. He used computerized louvers to increase natural cooling.

The Center

The mysterious forms of the Center are unexpected and beautiful. One may enter the complex by a path that swings toward the lagoon, up a small rise and turn toward the building. This indirect path is the proper way of approaching a structure in the Kanak culture. It can be considered a village, with its own paths, greenery and public spaces.

The 81,000-square-foot complex is composed of 10 beehive-like pavilions each of different sizes and with different functions that are intended as a celebration of Kanak culture, reflecting a long legacy of architecture in the South Pacific. The ten pavilions, forming three villages, rise from the tropical vegetation to the sky, raise high above the ground at heights of 22 and 28 meters, creating a contrast of lightness and weight.[67] These structures are both alien and indigenous to its surroundings. The structure and functionality of the Caledonian huts were reproduced and

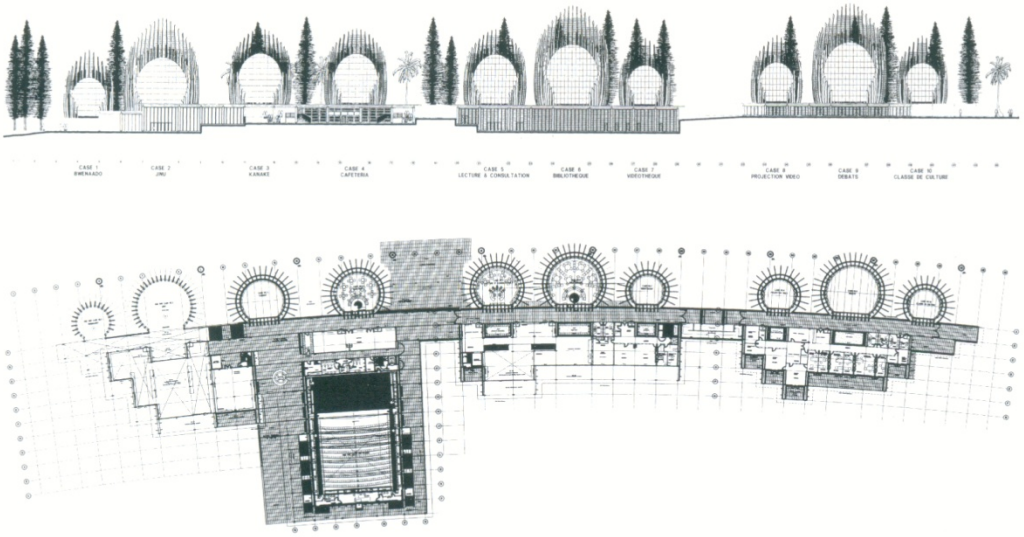
[67] Blaser, Werner. Renzo Piano Centre Kanak. (Basel: Birkhauser, 2001) 45.

adapted for the design of the Center. The huts are interconnected by footpaths and serve various functions or are of different themes, reflecting the linear patterns of the typical rural

Figure 16 Site Plan.[68]

[68] Pizzi, Emilio. Renzo Piano Studio Paperback. (Basel: Birkhauser, 2003) 26.

Figure 17 Floor Plan and elevation.[69]



village development. For example, the main pathway runs parallel to the peninsula; "the "pathway of history", is a series of metaphors for the Kanak representation of human evolution, including themes of death, rebirth and nature".[70]

The public space consists of the entrance, theater, (permanent and temporary) exhibition spaces, café, and gift shop. The middle section contains the offices for visiting scholars, a computer and media room, a conference room, a library and expedition halls. Near the tip of the peninsula are administrative offices and educational facilities, with service spaces underground. The site also includes a restaurant, dormitory for children from remote villages, workshops for visiting artists, and two outdoor performance spaces.

[69] Pizzi, Emilio. Renzo Piano Studio Paperback. (Basel: Birkhauser, 2003) 101.
[70] Richardson, Vicky. New Vernacular Architecture. (London: Laurence King Publishing, 2001) 136.

Reaction

Piano brought the local Kanak community together, in particular how they were used to help construct the Center. It is a Center for them, their history and culture, and I think having the community involved so deeply in the process, to the actual construction is very powerful. From that, the meaning of the Center has been strengthened. The Kanak people that the Center represents now have a closer tie and appreciation to the Center. With his expertise, Piano used high tech procedures to create this low tech design. How he incorporated the local materials and traditional construction methods, with contemporary technology and ecological design.

MUSEUM OF NEW ZEALAND TE PAPA TONGAREWA

Figure 18 Main Entry of Te Papa.[71]

Wellington, New Zealand

1992-1998

387,500 square feet

$167 million

[71] JASMAX. March 2009 <www.jasmax.com/>.

History of the Museum

Through the years, the Museum of New Zealand Te Papa Tongarewa (Te Papa) has experienced many changes. Known as the Colonial Museum, it began in 1865 located in a small building behind the new Parliament Buildings.[72] After multiple names and locations, in 1992 an Act of Parliament (the Museum of New Zealand Te Papa Tongarewa Act 1992) combined the National Art Gallery and the National Museum into one, forming Te Papa. The Museum was over ten years of planning and preparation, and it was not until 1993 when the architectural firm JASMAX Ltd., who won the design competition, began construction of the facility.[73] Te Papa (our place) is the largest national museum project of the world. Their mission is to: "present, explore, and preserve the heritage of its cultures and knowledge of the natural environment in order to better understand and treasure the past, enrich the present, and meet the challenges of the future".[74]

Design Approach

Located along Wellington's waterfront, the five story 36,000 square meters bi-cultural Museum is considered a powerful statement of New Zealand's cultural identity, while integrating the city

[72] Museum of New Zealand Te Papa Tongarewa. (http://www.tepapa.govt.nz/Tepapa/English/, 2009).
[73] Kent, Rachel. "Museum Report- Museum of New Zealand Te Papa Tongarewa." Acret, Susan. ART AsiaPacific. (Sydney: Fine Arts Press Pty Limited, 1998) 84.
[74] Museum of New Zealand Te Papa Tongarewa. (http://www.tepapa.govt.nz/Tepapa/English/, 2009).

and harbor into the design.[75] With a price tag of NZ$280,000,000.00, it represents a new breed of museum, focused on social, historical, environmental and cultural activities, all while expressing the relationship between the Māori and Pākehā (non-Māori New Zealanders) infused in the architecture.[76]

The bi-culture concept was key in the design approach of the Museum. The design team wanted the building to evoke memories of the past Māori and Pākehā encounters. The central spine of the building is translated from the Treaty of Waitangi. The location of the Museum was an inspirational design factor, as it is "a symbolic place where both waka and European boats were drawn up" along the edge of the sea.[77] The relationship between the site and culture was carried into the design of the Museum. The settlement patterns of both groups were transferred into the layout, with a grid form along the city for the Pākehā galleries to the south, while the Māori section to the north faces the sea and is more of a natural flowing design. Although the building unifies the two groups, the design approach of using the settlement patterns was actually to express the differences between the Māori and Pākehā. With regard to the objects that are housed in the building, the design was approach in a manner that both the Māori and Pākehā displays were of equal cultural value. By doing so, all the people of New Zealand are celebrated, highlighting the nation's progression towards reconciliation and reparation between the Māori and Pākehā.

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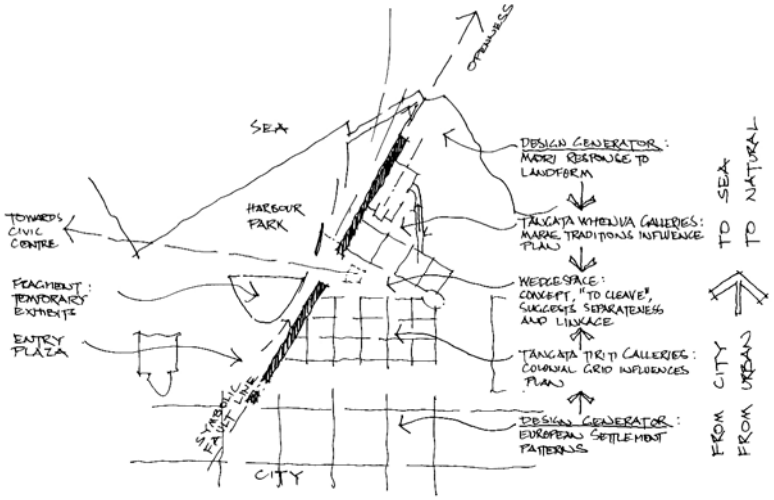
[75] Kent, Rachel. "Museum Report- Museum of New Zealand Te Papa Tongarewa." Acret, Susan. ART AsiaPacific. (Sydney: Fine Arts Press Pty Limited, 1998) 84.

[76] Hourston, Laura. Museum Builders II. (Great Britain: Wiley-Academy, 2004) 39.
[77] Hourston, Laura. Museum Builders II. (Great Britain: Wiley-Academy, 2004) 39.

Figure 19 Conceptual sketch show settlement patterns.[78]



With the concept in hand, the team began with the research of the settlement patterns. Although there was no type of settlement rules, during the initial research conducted by Dr. Mike Austin, the information he had gathered represented a repetition in the pattern, which proved to be a valid representation of the Māori. By investigating into the locations around the country of the marae, the traditional meeting place, these preferences were identified, bringing forth the Māori attitude towards the land. It was recognized that the preferences involved the "orientation towards the most open landscape aspect, towards the rising sun, with enclosure behind them".[79] This natural design form differed greatly to the European patterns, which was represented through grids. The use of street grids to mark the land is clearly identified in Wellington, as well as other colonized cities. These differences were brought together to identify the contrast and similarities of Te Papa, through its architecture and exhibits.

[78] Bossley, Pete. "Concepts Redirect, Redevelop." Architecture New Zealand (1998): 23.
[79] Bossley, Pete. "Concepts in Culture." Architecture New Zealand (1998) 18.

The Museum

The layout of Te Papa includes three key areas that links the past, present and future: *papatūānuku* (the natural environment), *tangata whenua* (Māori) and *tangata tiriti* (Pākehā).[80] Included in the main programmatic elements of the Museum are displays, long- and short-term, an auditorium, Te Marae (fully functioning meeting house), four discovery centers with research rooms dedicated for adults and children, and an early learning center for children. In addition to the traditional displays, high technology was incorporated into the overall experience, with reality rides and computer simulated earthquakes. Housed in Te Papa are over 2.6 million objects, artifacts and *taonga* (sacred treasures).[81] The different floors are organized per displays, with the natural environment displays are located on the second floor. New Zealand's social history and Māori culture exhibitions are located on the fourth floor, while on the fifth floor are art displays and the library.

One of the more unique qualities of Te Papa is its organization of its artifacts. With the goal of creating a bi-cultural museum in every possible way, meant that the concept of a museum had to be redefined. Typically, museums often organize their objects in categories that define a place, time, etc. However, in the case of Te Papa, in redefining a bi-culture museum, all the artifacts were brought together and accessible to all the departments in the Museum. The intent was to unify the collection and to allow the departments to flow together. In doing so, the departments had available three different exhibit zones: designated spaces, shared spaces,

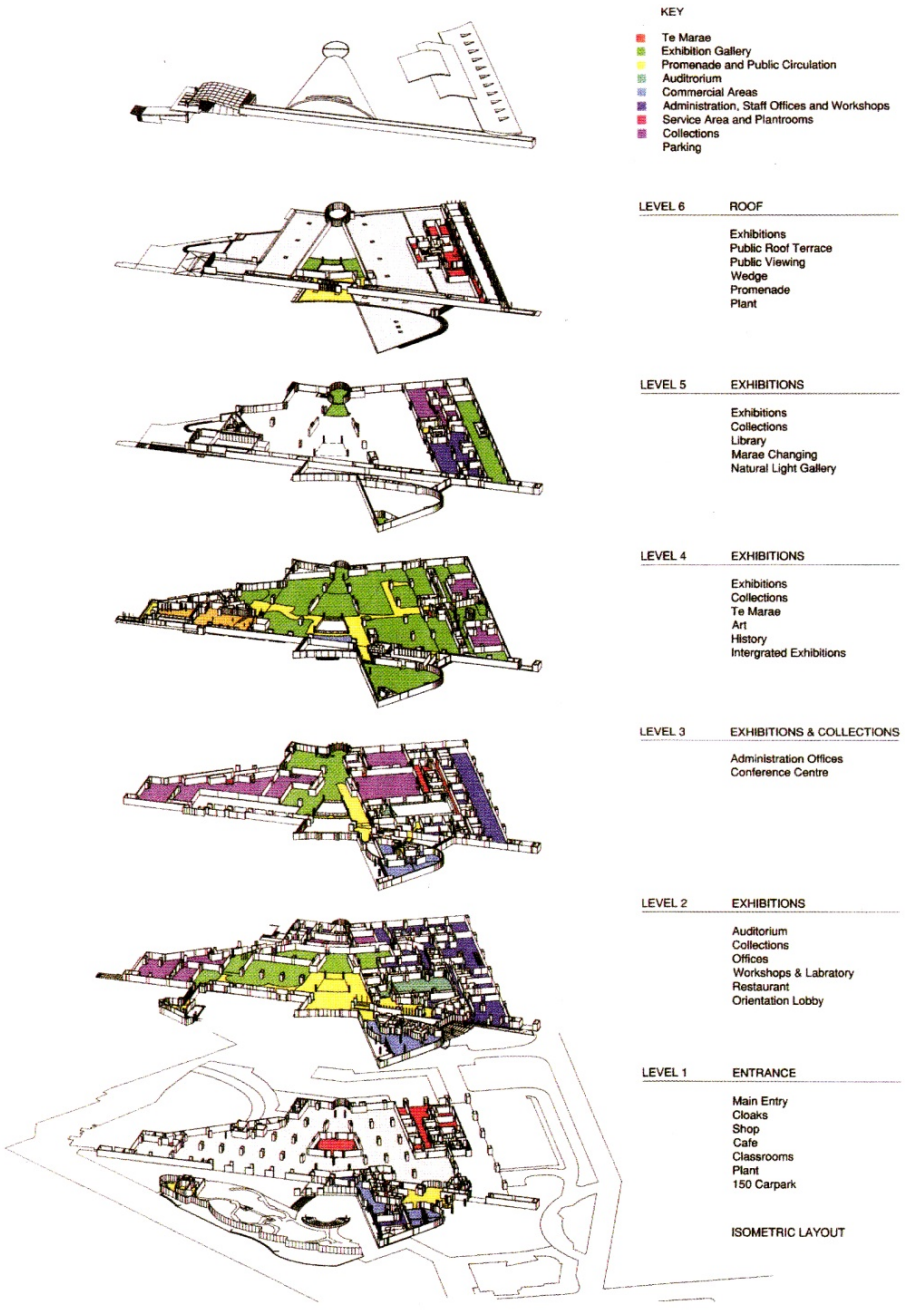
[80] Message, Kylie. New Museums and the Making of Culture. (Oxford: Berg, 2006) 175.
[81] Te Papa, Our Place a Souvenir. (Wellington: Te Papa Press, 1998) 46.

and integrated spaces. The designated spaces were intended to be used of a single department, while shared spaces were available to all departments. Integrated spaces were just that, the collaboration between some of the departments. These zones became a part of the Exhibitions Conceptual Plan, which helped to identify the space relationships that were created and their necessary adjacencies.

Figure 20 Exterior Renderings.[82]

[82] Hourston, Laura. Museum Builders II. (Great Britain: Wiley-Academy, 2004) 42.

Figure 21 Floor Plans.[83]



Plan views showing the organisation of the museum's accommodation

[83] Hourston, Laura. Museum Builders II. (Great Britain: Wiley-Academy, 2004) 40.

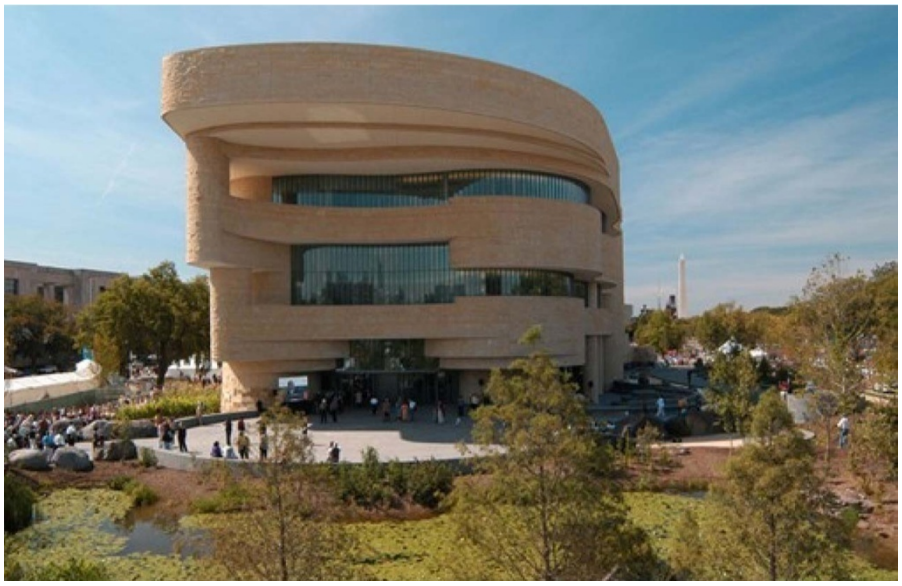
Reaction

The Museum was designed around unity through partnership, fusing together the rich cultures that define Aotearoa New Zealand. It is all within its name: Te Papa. The Museum captures the true meaning of the word "our", though its approach to design. The Museum is far more than a building that houses cultural objects, it is deeper in that it defines a movement of an entire nation. The design was used to unify cultures, bring them together and mend their history in order to move forward. It is about acknowledging the past in order to strengthen their future. The Museum and meaning behind it is entirely opposite to that of the CCRC. Although colonization has impacted the Chamorros and has shaped the island into what it is today, CCRC is about capturing the past, before the changes. The overall purpose of CCRC is to preserve the history and culture of the indigenous Chamorros, prior to contact with the western world.

Another interest facet in the design approach was how JASMAX chose to unify the Māori and Pākehā, through separating them. By identifying their differences, they were brought together under one roof. This approach is similar to that of Bearth & Deplazes Architekten when designing Bündner Lehrerseminar, Erweiterung Naturwissenschaftstrakt. Located in the dense forest in Switzerland, the architects wanted to create a relationship between the structure and nature. In order to identify and embrace nature, their approach was to actually create a building that was opposite, leaving it with the grey finish of concrete. Like JASMAX, they created a relationship by distinguishing its uniqueness.

NATIONAL MUSEUM OF THE AMERICAN INDIAN

Figure 22 View towards the Main Entry.[84]



Washington DC

1992-2004

250,000 square feet

$214 million

History of the Museum

The National Museum of the American Indian (NMAI) was founded in 1989 by the Act of Congress, during which the Gorege Gustv Heye collection was transferred to the Smithsonian Institution.[85] Included in this Act was a plan to create four interdependent facilities: NMAI on the National Mall in Washington DC, the NMAI Cultural Resources Center (CRC) in Suitland

[84] Douglas Cardinal Architects, Inc. 27 February 2009 www.djcarchitect.com/.
[85] Susan Strauss, Sean Sawyer. Polshek Partnership. (New York: Princeton Architectural Press, 2005) 114.

Maryland , the George Gustav Heye Center in New York City and the "Fourth Museum". The NMAI contains a large collection of the former Museum of the American Indian, Heye Foundation, of New York City. Heye began personally collecting objects in 1897, when he purchased a Navajo hide shirt in Arizona.[86] His collection quickly grew to include objects made from Native Americans, as well as the immense amount of photographs that captured the "artifacts, dress, daily habits, and ceremonial life of the peoples [Heyes] encountered".[87] It was not until 1904 when Heye began a collections catalog and the idea of a museum emerged. With the support of his friends and 58,000 objects, the Museum of the American Indian (MAI) was built in New York, in 1916, of which he appointed himself the Director for Life.[88]

The Museum's transfer to the Smithsonian Institution, brought substantial changes, not only to how the collection was managed, but also their mission. Heye's mission for MAI was to "the preservation of everything pertaining to our American tribes".[89] In contrast, the NMAI focused on the importance of creating and maintaining a partnership with the Native American people and their contemporary lives. They are "dedicated to the preservation, study, and exhibition of life, languages, literature, history, and arts of Native Americans".[90]

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[86] Smithsonian National Museum of the American Indian. (http://www.nmai.si.edu/, 2009).
[87] Johnson, Tim. Spirit Capture. (New York: Alexander Hamilton U.S. Custom House, 1999) 8.
[88] Smithsonian National Museum of the American Indian. (http://www.nmai.si.edu/, 2009).
[89] Smithsonian National Museum of the American Indian. (http://www.nmai.si.edu/, 2009).
[90] Smithsonian National Museum of the American Indian. (http://www.nmai.si.edu/, 2009).

The Collection

The collection represents all major culture areas in the North, Central and South Americas, which are displayed in permanent and temporary exhibitions at the Museum galleries. Over half of which are archaeological, in addition to the ethnographic, modern and contemporary arts. The rich collection includes four components: the Object, Photographic Archive, Media Archive, and Paper Archive, some of which date back to the late 1800s. Although the collection is labeled as four different entities, they all relate to one another. The NMAI is considered to have one of the world's most significant collections that document the Western Hemisphere Native Americans.

The Paper Archive contains records and special collections totaling approximately 1,500 linear feet. The records date back to the 1830s and document the history of the MAI and NMAI. In addition, it also includes unpublished manuscripts, field notebooks, scrapbooks, photographs, collection listings, planning materials and correspondence. [91]

Approximately 324,000 images, which include negatives, vintage prints, transparencies, lantern slides, glass-plate negatives, color slides and digital photos, are contained in the Photo Archive. The collection captures the Native American culture and history from the mid-nineteenth century to the present. The Photo Archive includes images of historic scenes, portraits and expeditions, as well as artifacts, dress, daily habits and ceremonial life. [92]

[91] Smithsonian National Museum of the American Indian. (http://www.nmai.si.edu/, 2009).
[92] Smithsonian National Museum of the American Indian. (http://www.nmai.si.edu/, 2009).

Video tapes, motion picture films and audio recordings totaling more than 12,000 make up the Media Archive. They date back from 1902 and include interviews, performances, cinematic films and documentary recordings. The materials are in the form of motion picture film, analog and digital video tape recordings and audio recordings on wax cylinders, phonograph discs, audio tapes and compact discs.[93]

Design Approach of the NMAI

The NMAI was intended not to be a traditional museum, therefore there was a non-traditional approach to its design. This type of approach started with the design of the Museum, which began in the early 1990s when the Smithsonian organized a meeting held at the Native American homelands, which was attended by a group of advisors who were Native American elders, artists, educators and other professionals. The Native American involvement was critical to the design process, as it was a Museum of their history and culture. The Native Americans had a direct involvement with the project.

The design team of the 23,225 sq m Museum consisted of Native Americans, Donna House, Ramona Sakiestewa, Douglas Cardinal and Johnpaul Jones. However, towards the end of the project, Douglas Cardinal departed from the team and other architects stepped in.[94]

During the initial stages of design, two elderly women advisors visited the site, during which they identified its center. It is there where the stone sits at the center, with a rotunda designed

[93] Smithsonian National Museum of the American Indian. (http://www.nmai.si.edu/, 2009).
[94] Jenkins, Tiffany. "Native Habitat." Blueprint (2004): 76-81.

around it. The designers did not want to obstruct the cardinal directions, which were incorporated into the design. How the Native Americans conduct their lives, they need to know which is north, south, east and west. Although the most of the Museum's visitors will be coming

Figure 23 View of the facade.[95]

from other museums on the Mall, which is located to the west, the designers wanted to locate the main entrance at the east. This allows the visitors to walk around the site and enter through the east entrance, which faces the Capitol. To respect the view, wetlands were placed at the east, allowing an unobstructed view of the Capitol.

The project had height and setback limitations to conform with the overall architecture of the Mall. The concept was to imagine the building as a rock that had been eroded and carved from

[95] Douglas Cardinal Architects, Inc. 27 February 2009 www.djcarchitect.com/.

the grace of wind and water. The three dimensional object left behind would have a very natural quality.

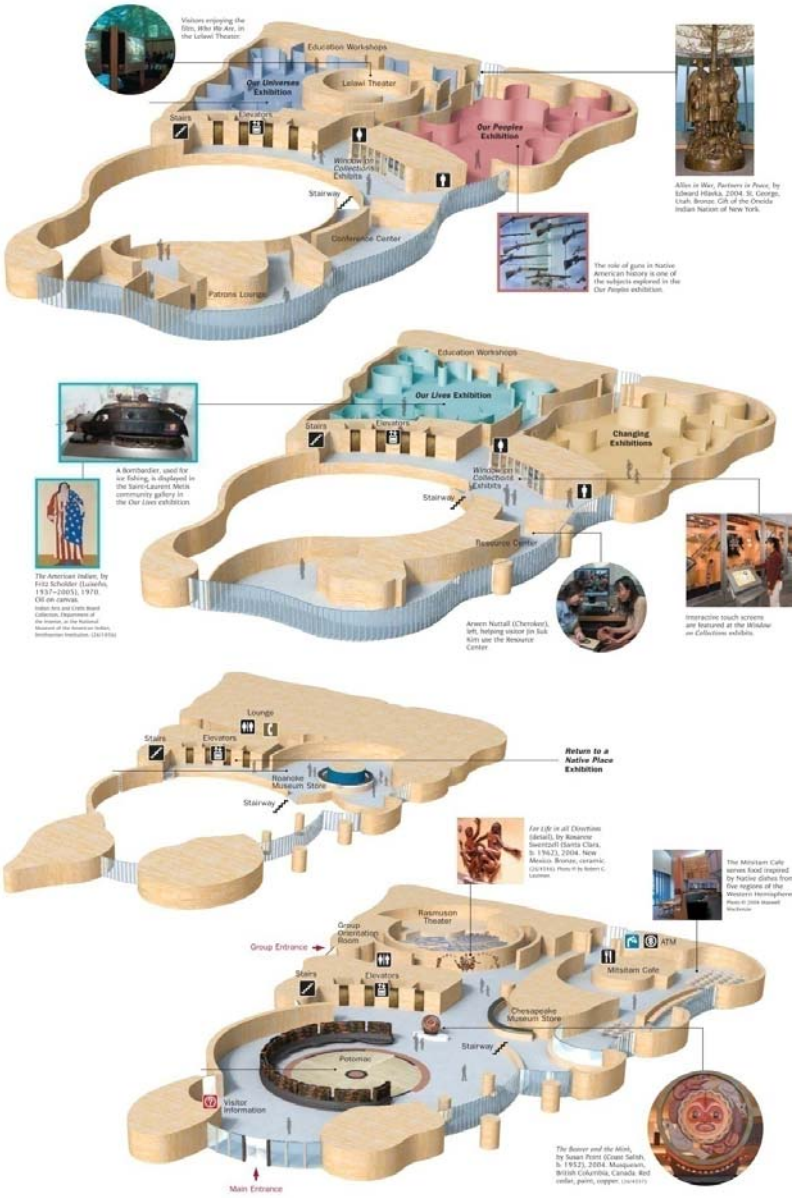
The Museum

Home to the most extensive Native American collection, the $214 million dollar construction cost was split between the Smithsonian and Congress.[96] The stone placed by the two elderly Native American women signify the central gathering place. It is known as the Potomac, and is where visitors may enter into the Museum, as well as a place where they can enjoy live presentations and social events. There are both permanent and temporary exhibitions that are housed in the Museum. The exhibits include Native American life and history, as well as artists' works or other objects from other museums. The permanent exhibits are divided into three groups, each with different focuses: Our Universes, Our Peoples, Our Lives. The Museum also includes a couple of theaters, providing a place for plays, storytelling, dance and music presentations, as well as film and video filming. The space may also be used for lectures and seminars. Located within the Museum is also a Resource Center, where the visitors can learn more about the Native Americans. An Interactive Learning Center is a part of the Resource Center, in addition to other reference collections. In addition to the exhibits and learning resources that is provided in the Museum, there is also a café and museum stores for the visitors. At the Mitsitam Café, visitors are able to indulge in the indigenous cuisines of the

[96] Jenkins, Tiffany. "Native Habitat." Blueprint (2004): 76-81.

Americas. Visitors also have the opportunity to purchase a piece of the Native American world by being able to buy Native American jewelry, art work, as well as souvenirs, books and toys.

Figure 24 Floor Plans.[97]



[97] Smithsonian National Museum of the American Indian. 2009. 27 February 2009 <http://www.nmai.si.edu/>.

NMAI CULTURAL RESOURCES CENTER

Figure 25 View of facade.[98]

Suitland, Maryland

1992-1999

140,000 square feet

Design Approach of the NMAI Cultural Resources Center

CRC remains the focal point for many of NMAI's Native component, as it is home to about ninety percent of the NMAI collection, as well as a research and interpretive center. Like the design team that created the NMAI, the Native American involvement also played a big role during the

[98] Polshek Partnership Architects. 27 February 2009 http://www.polshek.com/.

design of the CRC. The joint venture, comprised of Polshek Partnership and Metcalf Tobey Davis, formed an association with the Native American Design Collaborative (NADC). The design goal of CRC was to create a native place that is welcoming, as well as secure and technically advanced to protect its priceless collection. It maintains a balance of Native American cultural traditions, attitudes and curatorial demands, with the spiritual content and building type.

Venturi, Scott Brown and Associates completed *The Way of the People*, the programmatic framework for the four Smithsonian Institute facilities, which identified CRC's role as the "brain and soul of NMAI".[99] The program for CRC included collections storage, conservation laboratories and workshops, curatorial and administrative offices, a research library, public reception and study rooms, public programs, as well as interior and exterior ritual spaces. In total, these elements were contained in the 140,000 square feet facility.[100]

At the center of the concept were the "[site], massing strategy, plan organization, and detail development".[101] The design started in 1992 with a week-long site study, during which design challenges became apparent. The designers were limited to a pre-selected site located at the eastern corner of the Smithsonian collection campus. The site was L-shaped, adjacent to a busy public road, making it difficult to integrate the relationship between the building and the landscape, which was important to the spiritual character of CRC. As a result, the master plan was reconsidered and the entire eastern end of the campus was provided to the development of CRC.

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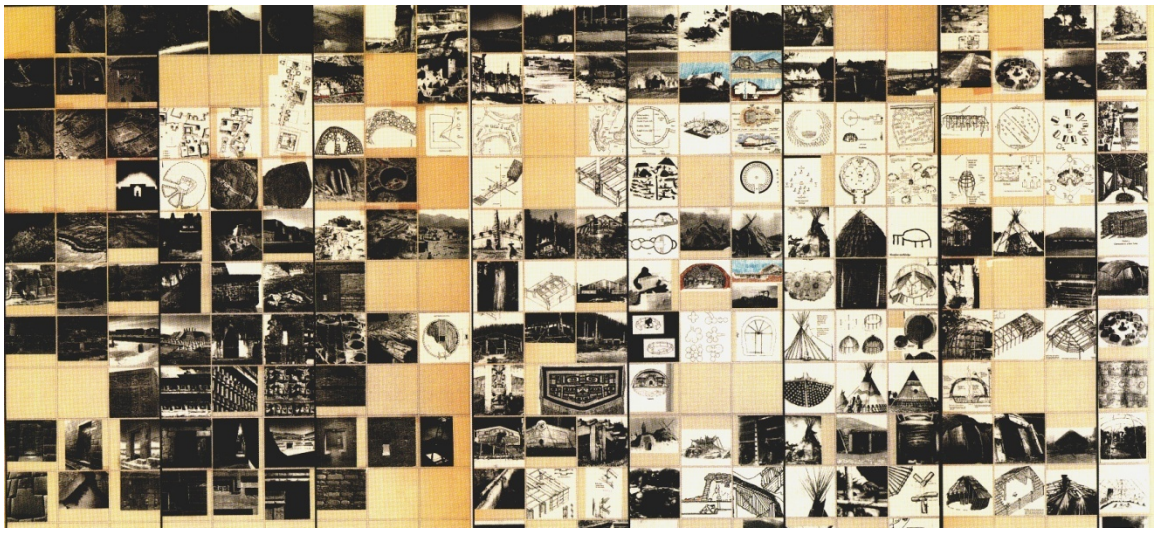
[99] Susan Strauss, Sean Sawyer. Polshek Partnership. (New York: Princeton Architectural Press, 2005) 114.
[100] Susan Strauss, Sean Sawyer. Polshek Partnership. (New York: Princeton Architectural Press, 2005) 118.
[101] Susan Strauss, Sean Sawyer. Polshek Partnership. (New York: Princeton Architectural Press, 2005) 116.

The design of the building was developed to allow it to sit and blend with the landscape that surrounds it, embracing the belief systems and building traditions of the Native Americans. The design team used the Native American building and design traditions to guide them in defining the building. At the center of the design was the Cultural Analysis Matrix, which integrated ideas and imagery used throughout the conceptual design. The Matrix was a means of communication and reference for the design team. Oriented to the cardinal directions, the plan is a diagram of the interactive program.

Figure 26 Cultural Analysis Matrix.[102]



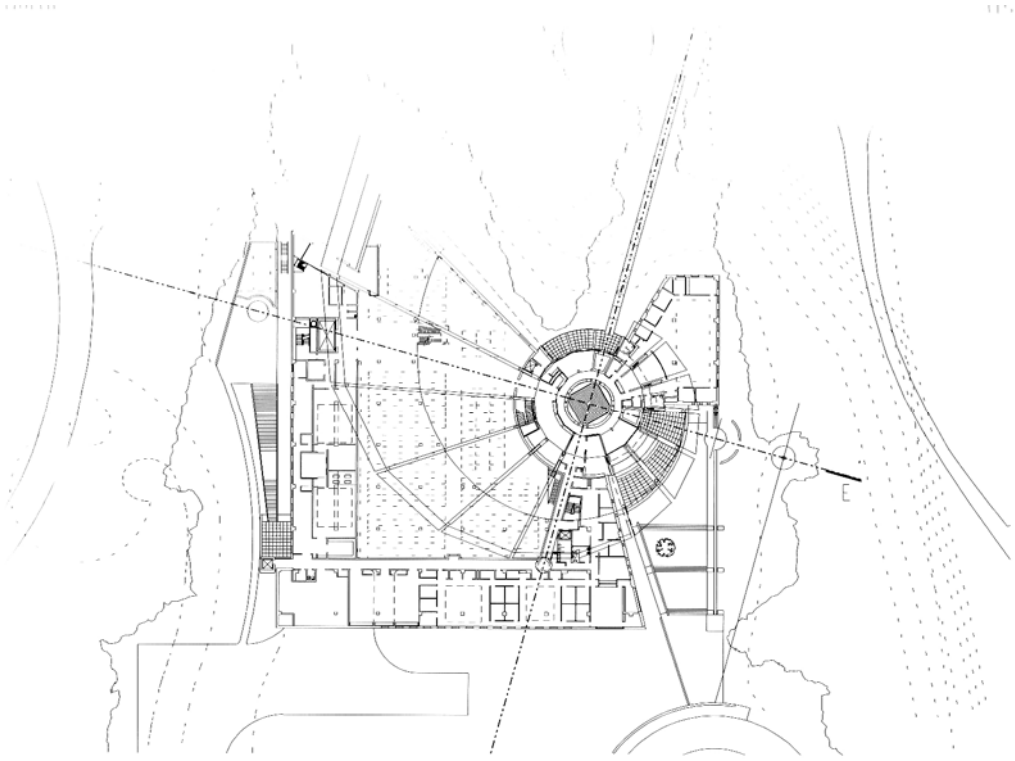
The Center

Like the NMAI, the cardinal directions were used to orientate the plan and to locate its central focus. The use of the rectilinear form helps to connect the Center to the built environment,

[102] Susan Strauss, Sean Sawyer. Polshek Partnership. (New York: Princeton Architectural Press, 2005). 116.

while the curvilinear profile addresses the landscape. The unique roof form of the Center was inspired by natural forms, including chambered nautilus, pine cone and the spider web. Located below the center of the roof, is a top-lit lobby, which is where circulation and the structure originates from. It is here where visitors are oriented to the different spaces of the building, which grow out from the center. The public lobby and entrance is lined by semi-public programmatic elements used as transitional spaces. They include offices, a conference room, a research area, study rooms and a lounge. A ceremonial space is located to the north, which is accessed by a bridge. The curatorial and conservation spaces run from the west or south,

Figure 27 Floor Plan.[103]



[103] Susan Strauss, Sean Sawyer. Polshek Partnership. (New York: Princeton Architectural Press, 2005). 123.

creating a barrier of protection to the collection, which is located within the three levels located under the spiral roof. The artifacts within these spaces are not organized by geographic region, instead everything is unified as one undivided space. The artifacts are organized based on hierarchy qualities, with the larger archeological pieces located on the bottom floor. The frequently visited ethnographic artifacts take up the main floor, while the top level closest to the sky is house to the spiritual collection.

The building's material and texture were evaluated based on their symbolic significance and qualities of light. Wood is used at various parts of the Center, including the columns and flooring in the lobby. To diffuse the natural sunlight that enters through the skylight at the center of the spiral, a wooden screen is used. Ochre colored concrete panels along the south and west facades incorporate the indigenous red clay soil.

Reaction

The most important factors of the entire design approach for both the NMAI and the CRC is the strong involvement of the Native American community. This non-traditional design approach of having them a part of the design was essential in the success of the projects. Not only did it help to create the outline of the NMAI and CRC, it also helped to distinguish their purpose and function in the community. It must have been challenging to creating a place that is home to the many Native American tribes in the Western Hemisphere. Not to mention, actually having them be involved and expressing their voice could have been overwhelming, in that there are many opinions that the designers were trying to incorporate into the design. However, at the

end, it was rewarding, in that the projects unite all the tribes and celebrate their culture and history with the rest of the world.

CONTENTS AND SCHEDULE OF ARCH 548 WORK

DESIGN PHASES

Phase 5: Conceptual Design Phase

The Schematic Design Phase is the initial stage when the research begins to develop into the design of the Center. Through the use of parti diagrams and other design strategies, the design begins to take shape. To get a visual idea of the Center, inspirational images will be gathered and used as ideas for the next phases of the design process. One of the most important factors in this phase and in the entire design is the creation of the Design Analysis Matrix. A matrix was

used as a tool during the design of the NMAI CRC. After further investigation, the program may have to be revised as necessary. Massing models will address conceptual design issues, including, solid vs. void, opacity vs. transparency, etc. Schematic floor plans will be created during this phase and will begin to look at space relationships and function. At the end of this Phase, three concepts would have been developed, all with schematic floor plans, sections and exterior elevations.

Phase 6- Schematic Design Phase

With the conceptual floor plans complete, the Schematic Design Phase will begin to develop the plans further. One of the three concepts developed in the previous Phase will be selected to develop further into the design of the Center.

Phase 7- Design Development Phase

It is during this Phase when the design issues will be identified and resolved. The landscape that surrounds the Center is an integral part of the design. In addition to the floor plans, the landscape plans will also be developed. The use of native plants to the island of Guam will reinforce the Center and its purpose. Building sections and exterior elevations will also be developed and finalized during this phase.

Phase 8- Presentation Documents Phase

The design will be all worked out once the Presentation Documents Phase begins. This phase is focused on bringing the design drawings to the next level, transforming line drawings to presentation images. The design will be brought into a 3D model, from which interior and exterior images will be taken from. In addition, axonometric renderings will also be created, providing another angle to display the floor plans. If possible, a fly through with the 3D model may also be created, helping to place people into the actual Center.

DELIVERABLES AND SCHEDULE

** Schedule based on Hawaii Standard Time .*

*** Dates represent submittals and meetings.*

may 2009

05.22.09 (F) Sustainable Design Meeting (Sharon Ching Williams)

june 2009

06.26.09 (F)	Conceptual Design No. 1

july 2009

07.17.09 (F)	Conceptual Design No. 2

august 2009

08.07.09 (F)	**Complete Phase 05: Conceptual Design Phase**
	Conceptual Design No. 3
08.13.09 (TH)	Committee Meeting No. 5
08.28.09 (F)	**Complete Phase 06: Schematic Design Phase**
	Chair Meeting

september 2009

09.03.09 (TH)	Committee Meeting No. 6
09.18.09 (F)	**Complete Phase 07: Design Development Phase**
	Chair Meeting
09.24.09 (TH)	Committee Meeting No. 07

october 2009

10.02.09 (F)	**"In-Process" Submittal**
10.08.09 (F)	**Complete Phase 08: Presentation Documents**
	Chair Meeting
10.12.09 (M)	Complete Pass/Fail Defense Presentation Layout
10.15.09 (TH)	**Pass/Fail Defense**
	Submittal of Form III
10.30.09 (F)	**Submittal of D.Arch Project**

november 2009

11.06.09 (F)	Complete Final Oral Defense Presentation Layout
11.12.09 (F)	**Final Oral Defense**
	Submittal of Form IV
11.16.09 (M)	*Last day for Final Oral Defense and submittal of Form IV*

december 2009

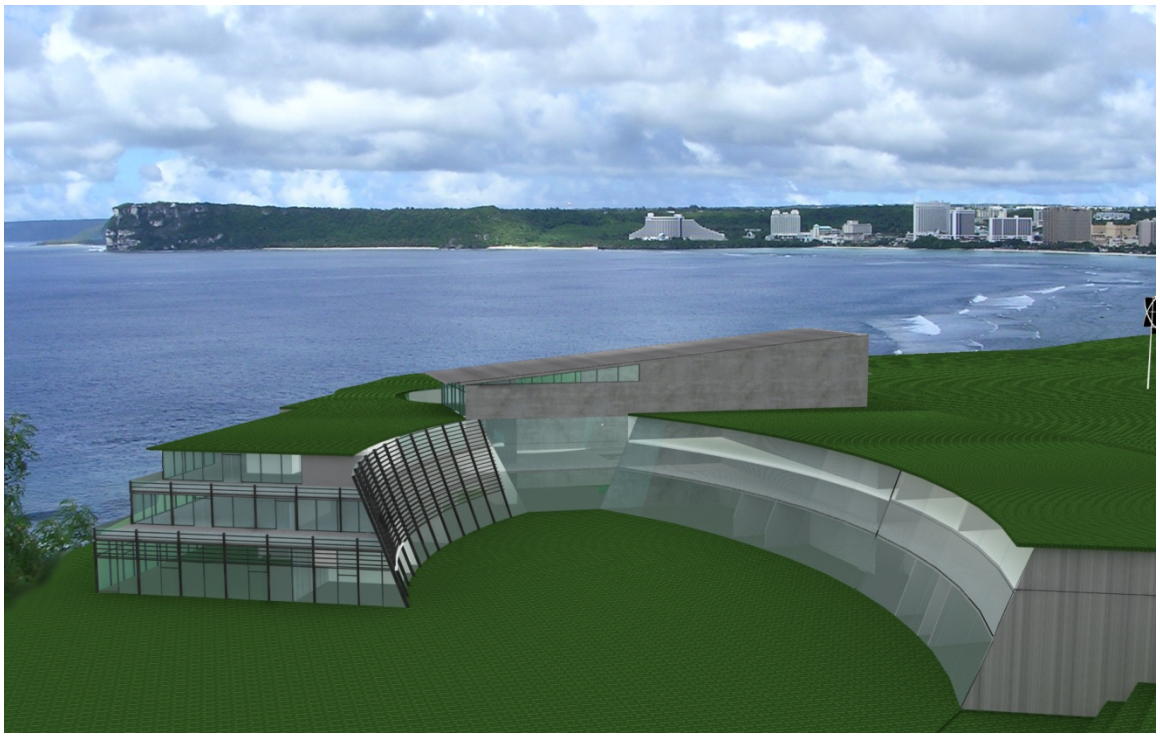
12.10.09 (TH)	*Last day to submit complete D.Arch project*

phase 02
THE DESIGN

THE NEXT STEP

TRANSLATING WORDS INTO DESIGN

Figure 28 View of the CCRC, with Tumon Bay in the background.



The information uncovered in Phase One was used as the foundation of the Center's design. It pointed out the important factors that define the Chamorro people, which make them unique and set them apart from other indigenous populations. Primarily, the Pre-Contact and Post-Contact sections identified the people of whom the Center represents.

The Case Studies provided a design guideline for cultural and research centers. To select projects that represent indigenous people was important, in that it portrayed how the designers were able to transfer the people's history into a building. It was used as a tool, to primarily understand the function of these types of buildings and distinguish the types of spaces found in the buildings and how the spaces are used.

Having a wealth of knowledge and understanding of the Ancient Chamorros and their life story that has unfolded to what it is today, was the first phase of the creation of the CCRC. It is now about compiling the rich culture and history, using it to imbue the design into something that is tangible, something more than just words.

The CCRC was designed to be the cultural and historical locus that celebrates the lives of the Chamorros. It combines a research center with various spaces that provide layers of cultural interaction. The Center, which houses Guam's collection of artifacts, is dedicated to the preservation, study and interpretation of these cultural objects once used by the indigenous people.

The initial step in the Design Phase was to select a site and to create a program. An intimate relationship between the building and the landscape was essential to the design of the Center. With these items figured out, design could begin. The design approach was rather standard to

any other project. The main step was to come up with concepts that would help drive the building and relate it to the people that it represents. During the Schematic Phase, three concepts were explored with only one being selected, the Latte Stone concept, which will be described later in further detail.

Not only was it vital to design a building that represented the indigenous Chamorros, but it was almost equally important to design a building around sustainable design techniques. The goal was to integrate numerous green strategies into the design to minimize it's carbon footprint.

SITE ANALYSIS

TUMON VILLAGE SITE

The Center is in the village of Tumon, a location in close proximity to the tourist district of Guam. However, it is not intended to be a tourist trap, instead to create an educational experience and familiarize visitors with the local cultural traditions. The topography of the site is generally a flat surface located at the top of a cliff that overlooks Tumon and Tumon Bay. At its elevation and location, it is possible to see the northern part of Guam to the right, while to the left the southern part is visible. It is a great central location to bring the island together, mingle with visitors and frame beautiful views of the island.

SITE INFORMATION

Owner	Chamorro Land Trust
Lot Number	5173-1-R2NEW-R2
Lot Area	195,223 +/- square meters (2,101,362.88 +/- square feet)

Current Zoning

Zoning	R-2 (Multi-family Residential)
Front Yard Setback	15’-0”
Side Yard Setback	8’-0”
Rear Yard Setback	10’-0”
Height Limitation	3 stories totally 30’-0”

Zoning After Variance

Zoning	Commercial
Front Yard Setback	0’-0”
Side Yard Setback	0’-0”

Rear Yard Setback 20'-0"

Height Limitation 3 stories totally 30'-0"

Climate

MONTH	AVERAGE TEMP.	HIGH TEMP.	LOW TEMP.	AVERAGE HUMIDITY	WIND DIRECTION	WINDSPEED	PERCIPITA-TION
JANUARY	78°	84°	71°	75%	E	13mph	5.90"
FEBRUARY	78°	84°	71°	74%	E	11mph	4.60"
MARCH	78°	85°	71°	73%	E	11mph	4.10"
APRIL	79°	86°	72°	72%	E	11mph	4.50"
MAY	80°	87°	73°	72%	E	10mph	6.50"
JUNE	80°	87°	73°	75%	E	10mph	6.40"
JULY	80°	86°	72°	78%	E	9mph	11.30"
AUGUST	79°	86°	72°	80%	E	8mph	15.20"
SEPTEMBER	79°	86°	72°	80%	E	8mph	14.50"
OCTOBER	79°	86°	72°	80%	E	9mph	13.30"
NOVEMBER	79°	85°	73°	80%	E	10mph	9.60"
DECEMBER	79°	84°	73°	78%	E	11mph	6.10"

Data from MyForecast.[104]

[104] My Forecast. 2009. April 2009 <www.myforecast.com>.

SITE PHOTOS

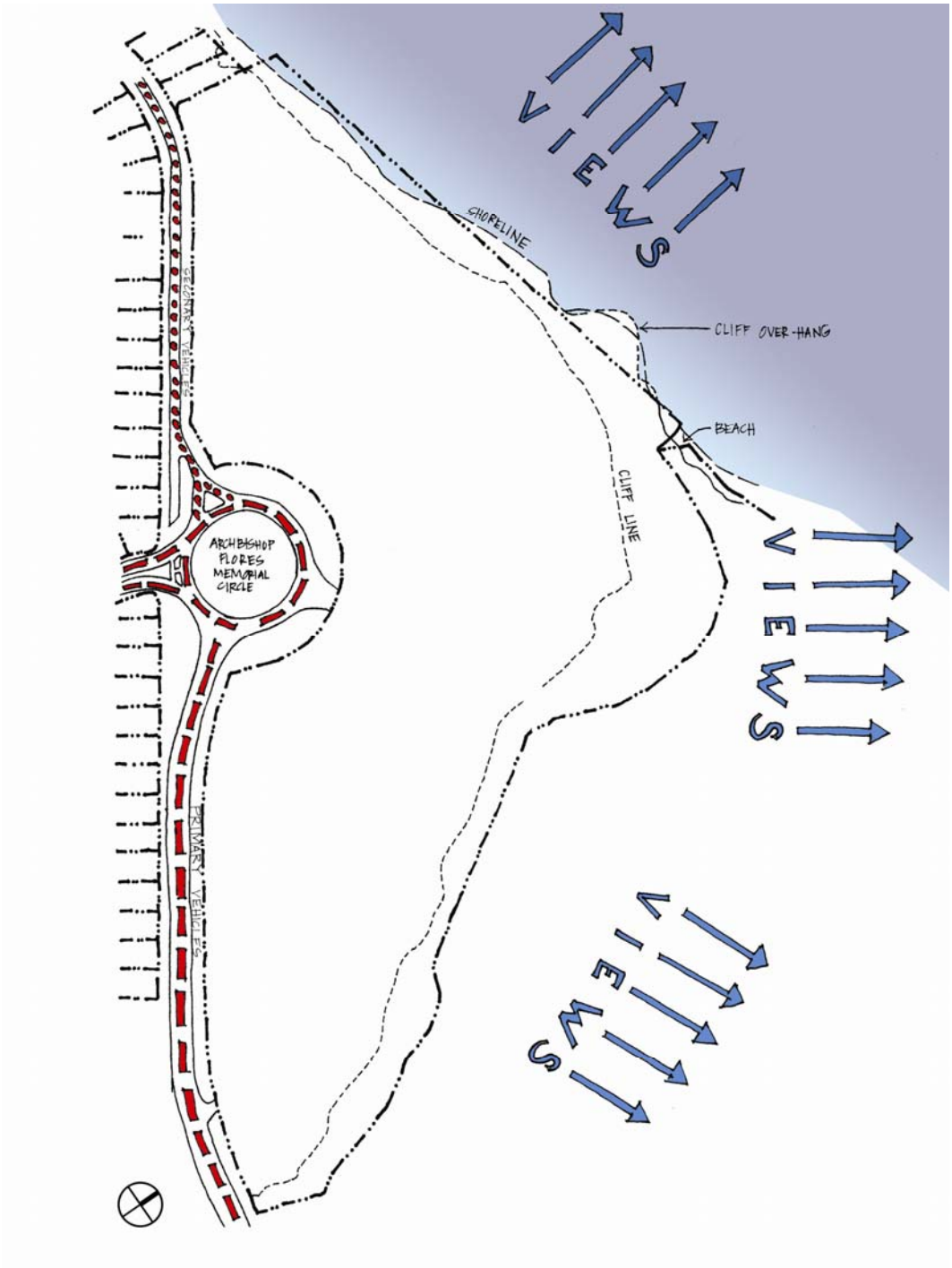
Figure 29 View towards the site from Two Lover's Point.

Figure 30 View from site towards Two Lover's Point.

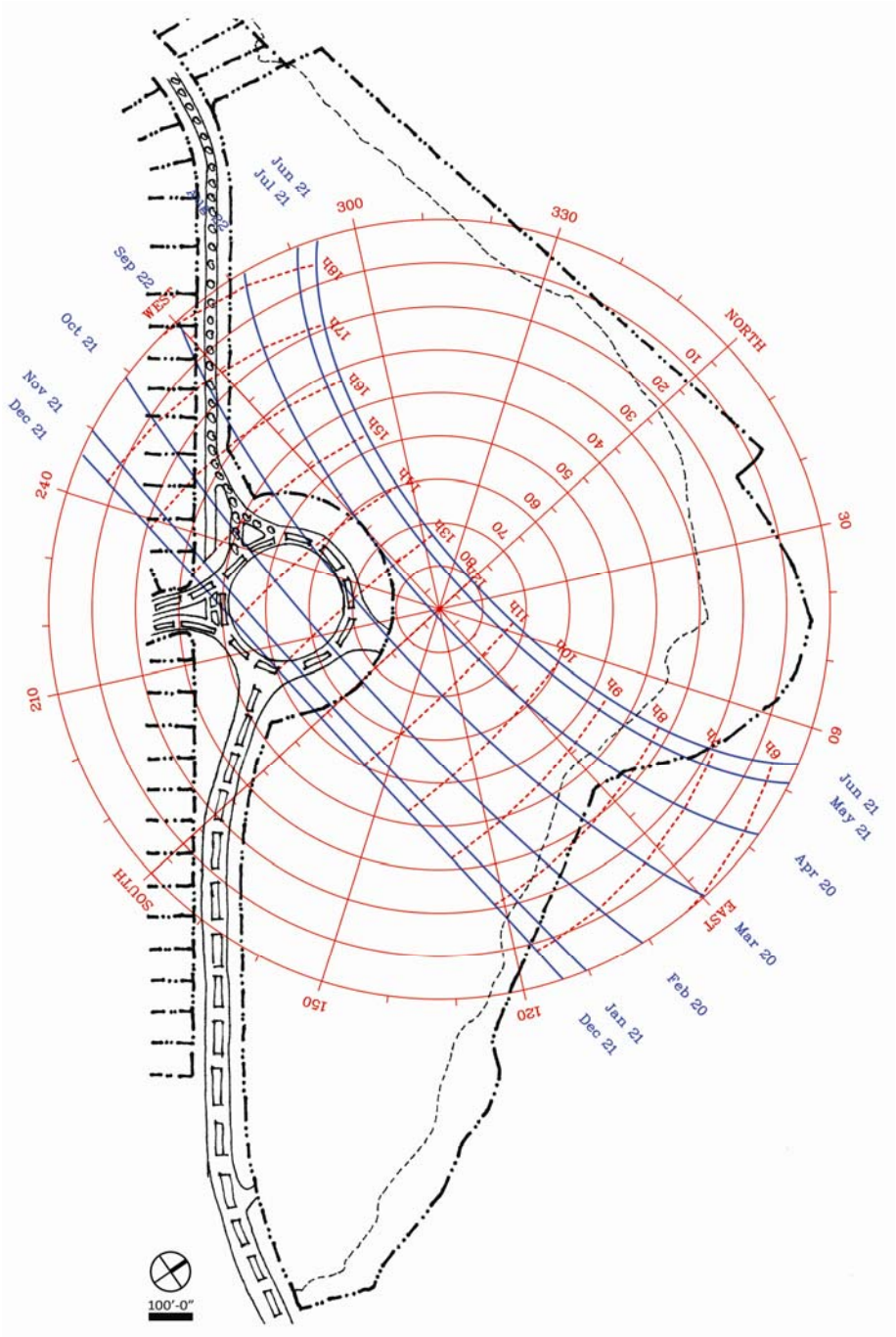
Figure 31 View of site.

Figure 32 View of site.

SITE ANALYSIS

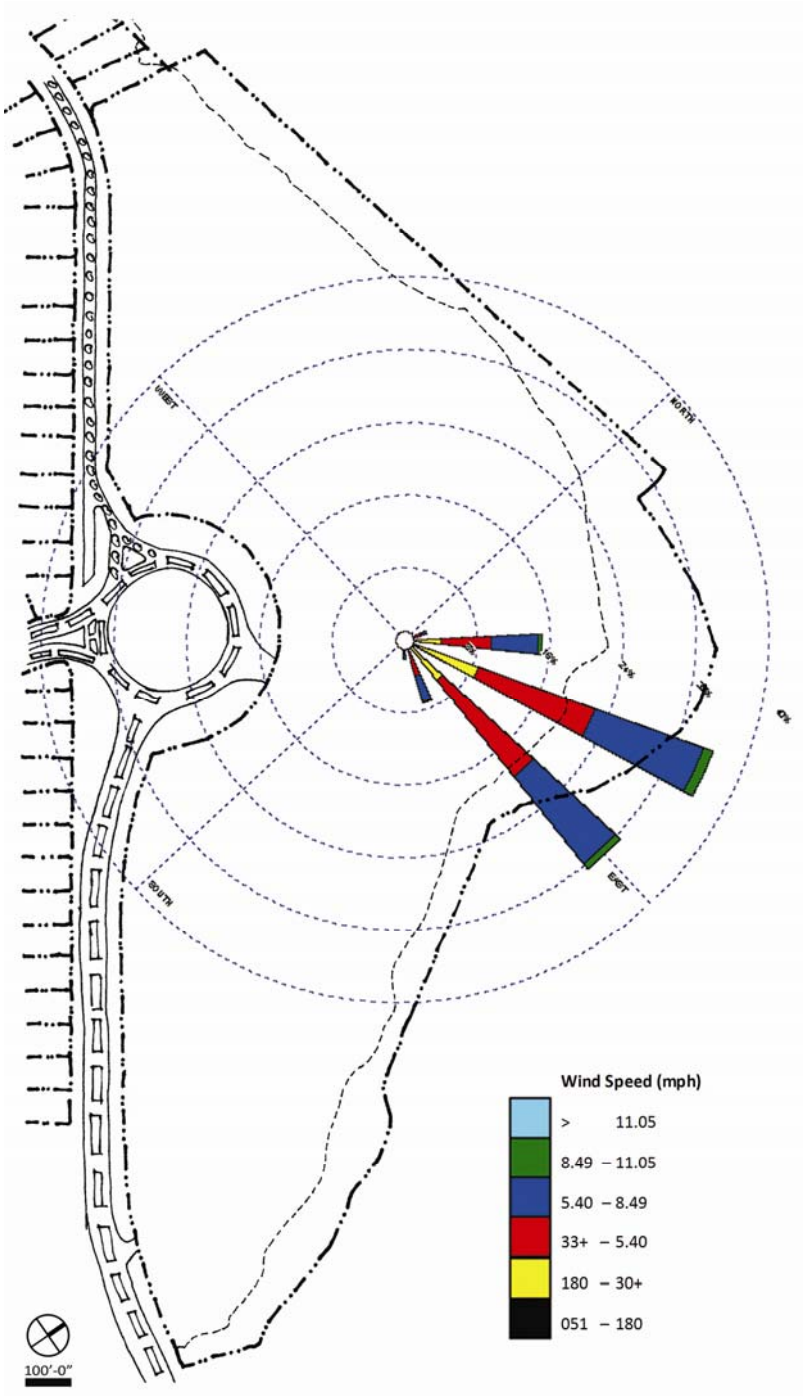


SUN DIAGRAM[105]



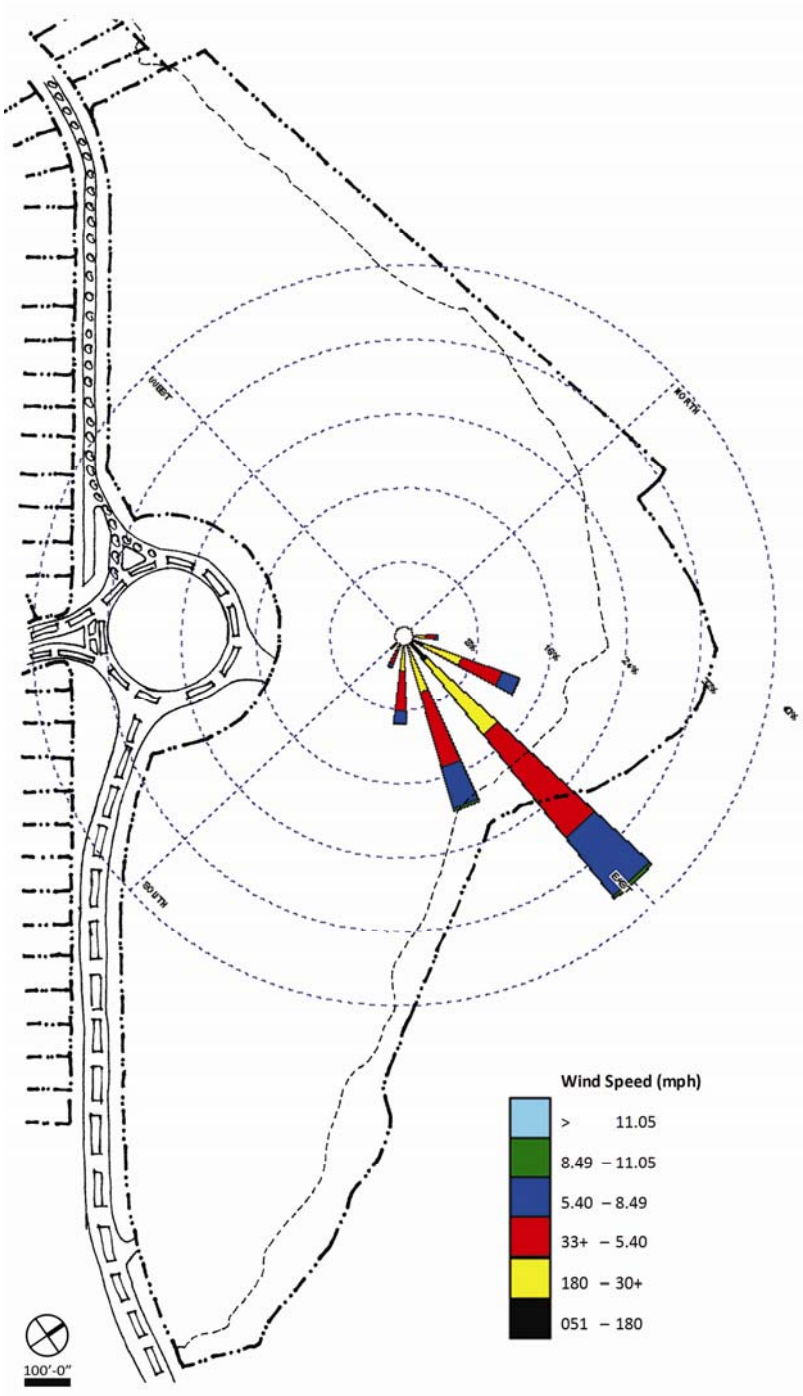
[105] University of Oregon Solar Radiation Monitoring Laboratory. 12 May 2009 <http://solardat.uoregon.edu/SunChartProgram.html>.

WIND ROSE – March[106]



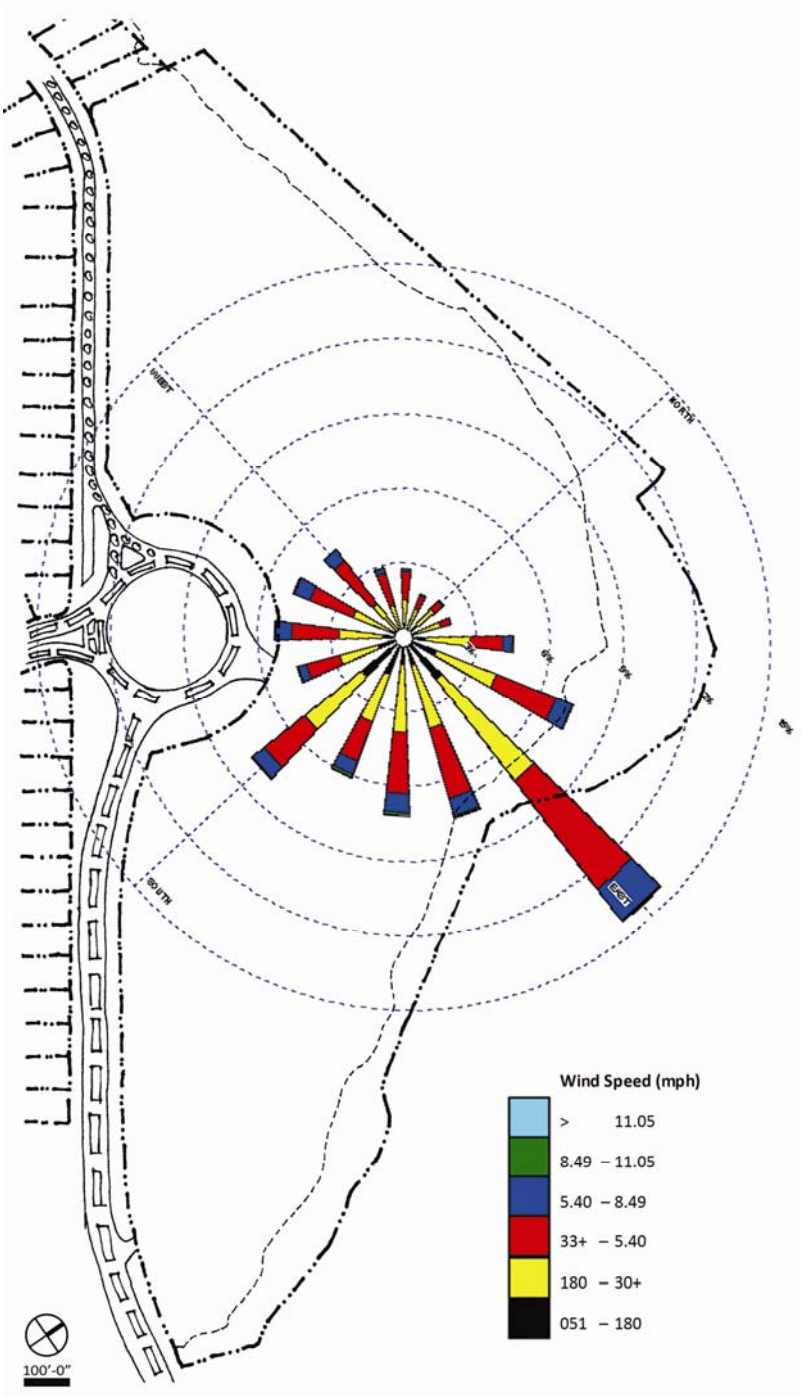
[106] United States Department of Agriculture Natrual Resources Concervation Service. 12 May 2009 <http://www.wcc.nrcs.usda.gov/climate/windrose.html>.

WIND ROSE – June[107]



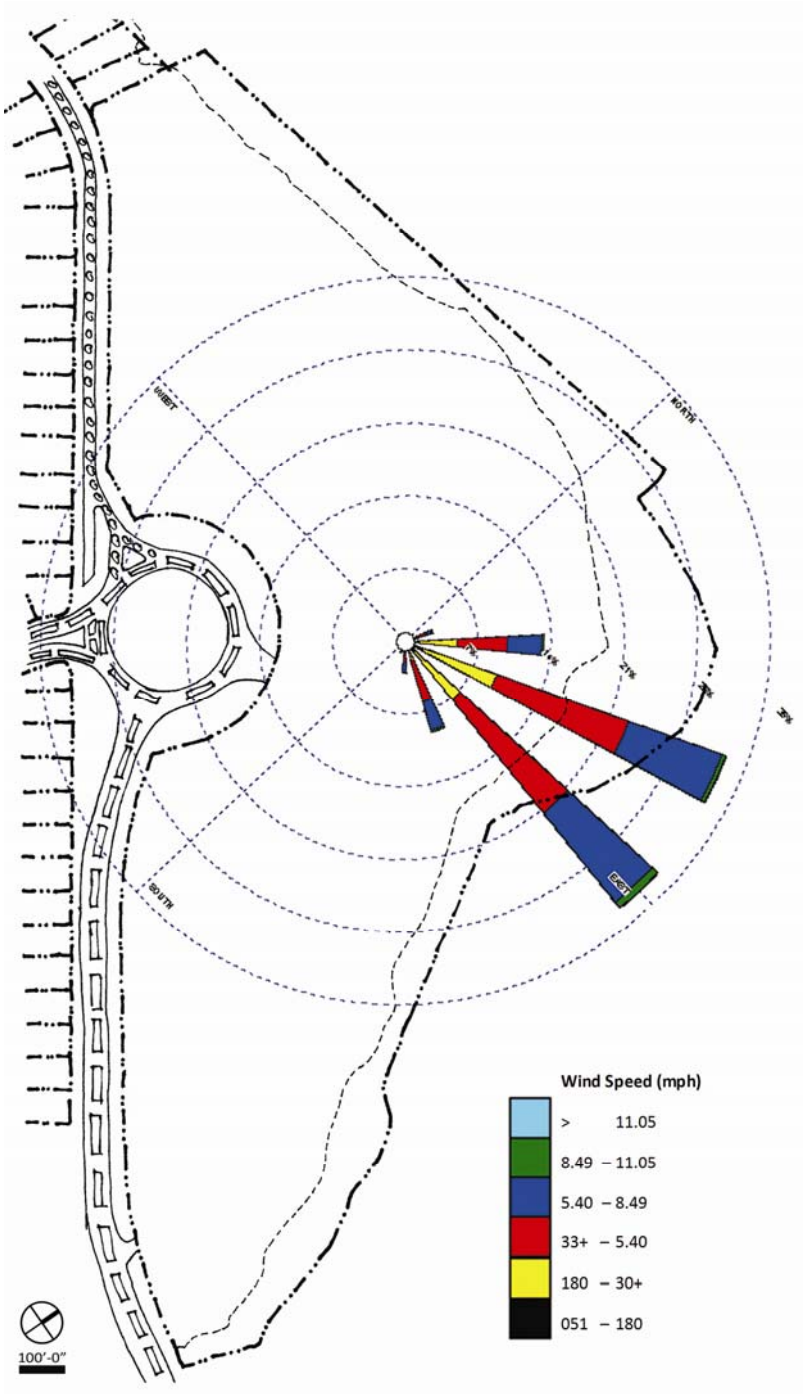
[107] United States Department of Agriculture Natrual Resources Concervation Service. 12 May 2009 <http://www.wcc.nrcs.usda.gov/climate/windrose.html>.

WIND ROSE – September[108]



[108] United States Department of Agriculture Natrual Resources Concervation Service. 12 May 2009 <http://www.wcc.nrcs.usda.gov/climate/windrose.html>.

WIND ROSE – December[109]



[109] United States Department of Agriculture Natrual Resources Concervation Service. 12 May 2009 <http://www.wcc.nrcs.usda.gov/climate/windrose.html>.

PROGRAM

PROGRAM NARRATIVE

The Center is a public platform for teaching the local and tourist community about the Chamorro culture and history. There are six programmatic categories of the Center:

1. Main Entry and Circulation Lobby
2. Administrative and Curatorial
3. Collection Archive
4. Cultural Center
5. Research Center
6. Services

Based on the building's final design, the six programmatic categories are further organized into three zones, which will be described in further detail later.

Main Entry and Circulation Lobby

Visitors to CCRC will primarily be traveling by vehicles or dropped off by bus or taxi. The Center's close location to the village of Tumon, will also allow visitors to arrive on foot. The parking lot is below grade, allowing the rear of the site to be free for the building and to take advantage of the beautiful views. The main entrance into CCRC is adjacent to the Archbishop Flores Memorial Circle, as shown in the Site Analysis. This helps to identify the main entry of CCRC, providing a dramatic initial experience for visitors.

In the entry lobby, visitors can seek information about the Center, where they will come in contact with the ticket officer. While at Level B2, visitors can enjoy a full bar, or travel down to B3 where they have the opportunity to make purchased at the gift shop. Public Toilets are also at this location on Level B3.

Administrative and Curatorial

The Administrative and Curatorial spaces are located in Zone 1. Within this area, the different departments of the Center are located in open offices. The departments include, Pre-Contact: History, Artifacts, Architecture and Temporary exhibitions; History Timeline Hall; Native Plant.

Offices for visiting and permanent scholars are also be in this area, as well as the educational department. Made available to all the departments is the shared support spaces which includes, a reception area, conference rooms, etc.

For the entire staff at CCRC, an employee lounge will be located in this zone on Level B1. This space is intended for employees to take their breaks or get ready for work. Full locker rooms are available for their use.

Collection Archive

The Center's collection will have a central location for easy access to both the Cultural Center and Research Center. For safe keeping, it is located at the bottom floor, Level B4, and is easily accessed by two service elevators on either ends of the building.

Cultural Center

The Cultural Center is comprised of both indoor and outdoor exhibits. The focus of the exhibits is the Pre-contact period of Guam and will be divided into four categories. They include History, Artifacts, Architecture and Temporary exhibits. There is also space allocated for Contemporary art pieces, which depict the Pre-contact period of Guam. In order to bridge the gap between past and present, a Timeline Exhibit will allow visitors to travel back in time from the Pre-contact

period of Guam to present day. This is located adjacent to the main entry and includes the major events that have shaped the island.

Outdoor exhibits are located in an open air space adjacent to the main exhibits. Also located outdoors is the native plant garden on the terrace along the restaurant. The site is landscaped throughout with native plants that are found on the island.

There are two performing spaces: outdoor amphitheatre and the auditorium. The amphitheatre seats 200 visitors and is used for various performances, including music, dance and drama, in addition to lectures.

The auditorium has 500 seats and can be used for lectures and conferences. Chamorro music and dance performances, as well as workshops and classes also take place in the space, as well as Drama productions. In addition to being used by the Center, it is also available for rent by outside organizations.

The main entry to the auditorium is to be located adjacent to the circulation lobby of the CCRC. This allows the circulation lobby to double as flow out space during an event.

The amphitheatre is located adjacent to the auditorium, making it possible to share the support spaces. The dressing rooms, costume storage, etc. will be shared among the two performing spaces. Additional back-of-house facilities for the auditorium are the equipment storage, projection booths, dimmer room, control booth, and trap room. There are also overhead lighting catwalks.

Behind the scenes is the exhibition studio, where the Center's employees design and construct the exhibits. There is also an area for storage of props and other equipment. The exhibition studio is available to the auditorium and amphitheatre, for the purpose of building their sets.

Another part of the Cultural Center is the 400 seat restaurant, where visitors can indulge themselves in traditional Chamorro dishes. The kitchen serves a dual function, capable of providing a cafeteria-type menu, as well as a more sophisticated restaurant cuisine. Adjacent to the kitchen is a demonstration kitchen, designed to accommodate groups of 10-15 visitors. It provides another layer of learning for the visitors, on how to create the native dishes. In addition, the demonstration kitchen can be also used as a back-up pantry for special parties at the Center. The restaurant may also be used for other events, such as wedding receptions, company functions and other types of parties.

Research Center

The Research Center is divided into both public and semi- private spaces. Available to visitors are the multi-purpose rooms where there are general meeting areas. These spaces are also used for small intimate lectures to the public, as well as demonstration areas. These spaces can be combined into one or two large spaces, used to accommodate a larger crowd. Activities such as weaving, musical performances, oral history interviews, etc. take place in this area. The multi-purpose rooms will be used primarily by school groups, however also made available for public events. Each room has full audio-visual and computer access to the central network. The

research library is located in this area on Level B1 and is open to the public as well as the Center's scholars.

In efforts to support continue education and discover more about the Ancient Chamorros, conservation laboratories are located in the Center. Within which, there is a treatment center, as well as wet and dry laboratories. To document the discoveries, a photography studio is available.

Services

Located in CCRC will be an area for the Services. This includes the loading and receiving, which is located in close proximity to the kitchen and exhibition studio. In addition, the building maintenance department will be in this area, as well as other building Services, such as the pump room, chiller room, etc. The Services are located on the western part of the site, away from the main entry and main roads. As shown in the wind rose, the wind primarily comes from the east, blowing the air immediately away from the building, instead of through it.

PROGRAM SCHEDULE

SPACE	QTY	SF	SUM SF
PARKING & DROP-OFF			0
Parking			1,923 stalls
Drop-off Curb			0
Bus Drop-off			0
Taxi			0
			0
MAIN ENTRY & CIRCULATION LOBBY			0
			0
ENTRY LOBBY			0
Lobby	1	2500	2500
Ticket Office			0
Ticket Counter	1	225	225
Office	1	150	150
Storage	1	50	50
Toilets			0
Men	1	300	300
Women	1	300	300
Janitorial	1	80	80
First Aid Area	1	80	80
			0
Gift Shop			0
Display	1	200	200
Cashier Counter/Workstations	2	80	160
Store Room	1	1500	1500
Storage	1	200	200
Office	1	150	150
RESTAURANT			0
Certified Kitchen	1	2,500	2500
Food Preparation Area			0
Pot & Pan Sink			0
Preparation Sink			0
Work Area			0
Storage Area			0
Freezer			0

Refrigerator			0
Serving Area			0
Receiving			0
Wash Area			0
Tray Return Area			0
Can Wash Sink			0
Mob & Broom Storage			0
Office			0
Furniture Storage			
Dining Area			0
Dining Area (400 seats)	1	4160	4160
Condiment Areas	1	50	50
Service Line (2-35ft lines)	2	1197	2394
ADIMINSTRATION & CURATORIAL			0
Open Office Spaces	25	225	5625
Support Open Offices	20	150	3000
Support Spaces			0
Reception Seating	1	200	200
Large Conference Room	1	600	600
Small Conference Room	2	150	300
Informal Breakout Centers/Work Room	5	200	1000
Printer/Copier/Fax Center/ Mail Center	1	80	80
Break Room Service Unit	1	340	340
Supply Room	1	80	80
File Area	7	144	1008
Server Room	1	176	176
EMPLOYEE LOUNGE			0
Employee Lounge/Dining	1	800	800
Men's Lockers			0
Toilet	1	300	300
Shower	1	250	250
Locker Room	1	150	150
Women's Lockers			0
Toilet	1	300	300
Shower	1	250	250
Locker Room	1	150	150
Janitorial	1	80	80

COLLECTION ARCHIVE			0
Photo Archive	1	8000	8000
Media Archive	1	8000	8000
Paper Archive	1	8000	8000
Object Archive	1	10000	10000
CULTURAL CENTER			0
			0
INDOOR EXHIBITIONS			0
Exhibition: Pre-Contact History	1	15000	15000
Exhibition: Pre-Contact Artifacts	1	15000	15000
Exhibition: Pre-Contact Architecture	1	15000	15000
Exhibition: Pre-Contact Temporary	1	15000	15000
Exhibition: Contemporary Temporary	1	10000	10000
History Timeline Hall	1	1000	1000
			0
OUTDOOR EXHIBITIONS			0
Exhibition: Pre-Contact Architecture	1	5000	5000
Exhibition: Native Plant Garden (throughout)			0
			0
EXHIBITION STUDIO			0
Exhibition Support Workroom	1	600	600
Exhibition Manager Open Office	1	225	225
Exhibition Support Staff Open Offices	5	150	750
Exhibition Conference Room	1	200	200
Exhibition/Graphic Design Studio	1	1000	1000
Exhibition/Graphic Design Supply Storage	1	100	100
Exhibition Staging and Clean Assembly	1	1500	1500
Exhibition Props Storage	1	200	200
			0
OUTDOOR PERFORMANCE			0
Amphitheatre			0
Stage	1	500	500
Seating (200)	1	2400	2400
			0
AUDITORIUM			0
Main Auditorium			0
Seating (500)	1	6000	6000
Stage	1	1200	1200
Support Spaces			0

Equipment Storage	1	300	300
Lighting Catwalks			0
Rear Projection Booth	1	400	400
Dimmer Room	1	300	300
Control Booth	1	300	300
Sound Booth	1	300	300
Trap Room	1	1200	1200
Stage Office	1	225	225
Boy's Dressing Room			0
Dressing Room	1	175	175
Makeup Room	1	250	250
Restrooms	1	200	200
Girl's Dressing Room			0
Dressing Room	1	175	175
Makeup Room	1	250	250
Restrooms	1	200	200
Costume Storage	1	175	175
Stage house	1	600	600
Green Room	1	250	250
Toilets			0
Men		120	120
Women		160	160
			0
RESEACH CENTER			0
			0
EDUCATIONAL PROGRAMS			0
Reception	1	400	400
Break Lounge/Prefunction (capacity 15)	1	225	225
Toilets			0
Men	1	300	300
Women	1	300	300
Janitorial	1	80	80
General Meeting			0
Multipurpose Meeting (seating 120)	1	1200	1200
Meeting Room Storage	1	60	60
Computer Lab	1	800	800
Education Workshops	4	800	3200
Lecture Area			0
Computer Work Station			0
Storage			0
			0

RESEARCH LIBRARY			0
Library Facility			0
Entry Vestibule	1	80	80
Exhibits	1	100	100
Check Out	2	80	160
Reference Desk	1	80	80
Lounge Seating	10	20	200
Table Seating	20	16	320
Carrels (study area)	10	30	300
Research Computer Terminals	8	20	160
Microfiche Cabinets	6	12	72
Microfiche Readers	2	20	40
Periodicals	4	12	48
Reference Stacks	10	12	120
Collections Stacks	100	12	1200
AV Work Room	1	200	200
Audio Lab	1	200	200
Audio Visual Media Collection	6	12	72
Duplication Center	1	80	80
ADP	1	88	88
Library Administration			0
Librarian's Office	1	120	120
Librarian's Assistant	2	80	160
Work Room	1	200	200
Store Room	1	300	300
			0
CONSERVATION LABOARTORY			0
Conservation Open Office	5	150	750
Conservation Workroom	1	800	800
Treatment Center			0
Technician Office	2	225	450
Work Area	1	400	400
Supply Room	1	100	100
Laboratory			0
Wet Laboratory			0
Laboratory Space	2	288	576
Service Corridor	1	288	288
Dry Laboratory			0
Laboratory Space	2	288	576
Clean Corridor	1	288	288
Photography Studio			0
Photography Room	1	550	550

Negative Development Room	1	60	60
Equipment Storage	1	80	80
Storage			0
Unsecured Storage	1	200	200
Secure Storage	1	200	200
Equipment Storage	1	200	200

SERVICES

			0
LOADING DOCK			0
Receiving Area	1	1000	1000
Loading Dock	1	1200	1200
Receiving Office	1	150	150
BUILDING MAINTENANCE DEPARTMENT			0
Maintenance Workshop	1	500	500
Storage	1	50	50
Outdoor Maintenance Equipment/Supplies	1	600	600
			0
BUILDING SERVICES			0
Air Handling Plantroom	1	3000	3000
Lift Machine Room	1	150	150
Pump Room	1	300	300
Fire Control Room	1	200	200
Chiller Room	1	1200	1200
Transformer/Switch Room	1	650	650
Main Switchboards	1	650	650
Central Communications Room	1	200	200

TRASH ROOM

THREE CONCEPTS

The Schematic Design phase included three concepts, each deriving from the time of the Ancient Chamorros and played important roles in their life and culture.

THREE CONCEPTS

Tree of Life- coconut tree.

Manhalla- fishing technique.

Latte Stone- architecture/artifact.

The goal of this phase was to explore three aspects and to come up with very different design strategies for the Center. It was to have a broad pallet from which to start with and to consider the positives and negatives of each design and determine which worked best for the function of the building and the site.

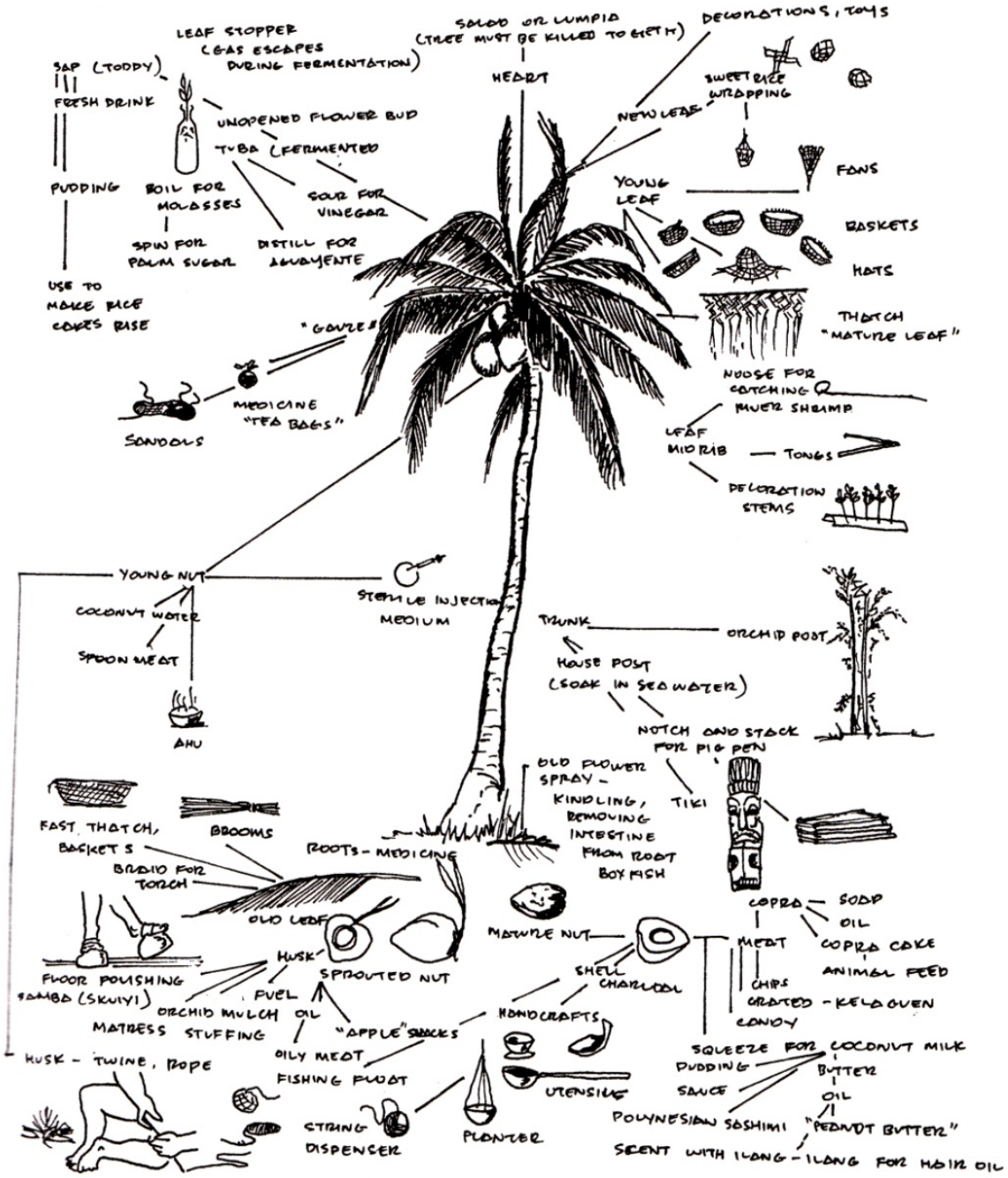
TREE OF LIFE

The Tree of Life Is circled around the idea of the *niyok* (coconut) tree, a plant native to Guam. The concept was selected because of the importance the coconut tree played in the lives of the Ancient Chamorro. Every part of the tree was used in their lifestyle. For example, the fruit was used as a source of drink and food, as well as oil, charcoal and soap. In addition, Ancient Chamorros made cooking utensils out of it, as well as planters and fishing devices. The leaves were woven together to make baskets and hats. The woven leaves were also used as thatch for the roof of the latte stone structures.

Design

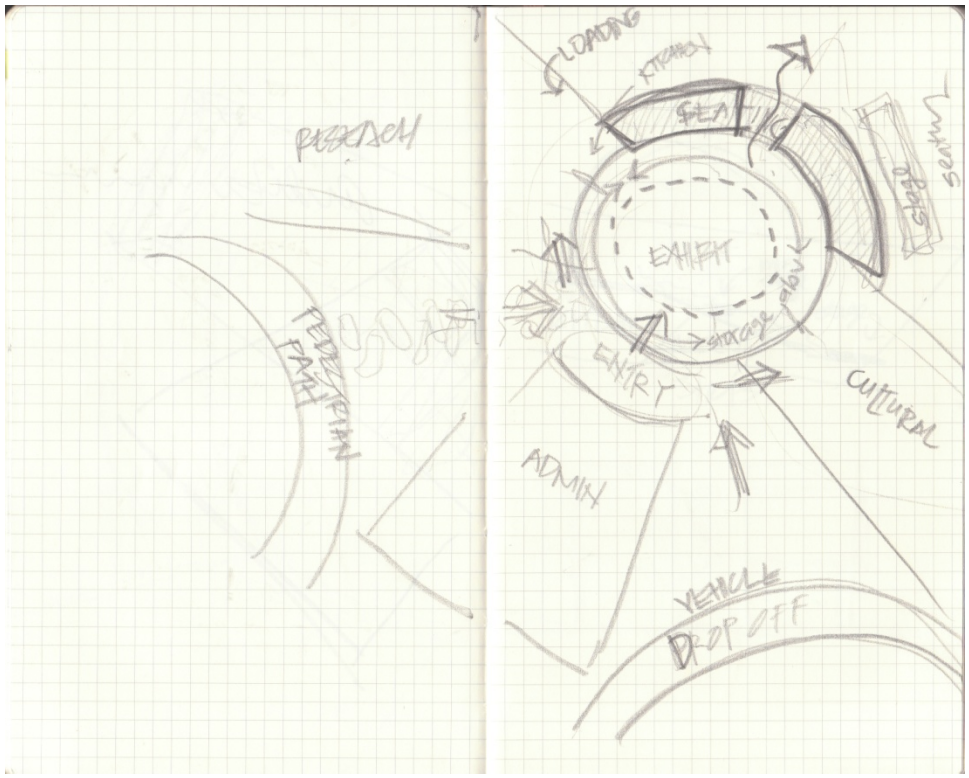
The CCRC is three stories and like a coconut tree, is organized around a cylindrical form at the center of the building. It is here where the main entry is located and visitors step into an open three story tall lobby. The lobby, with direct views of the Pacific Ocean, resembles a coconut tree trunk, with ramps that circle around the outer perimeter, replicating the lines on the tree's trunk. Along the ramp is the timeline exhibit that displays images and artifacts after the Ancient Chamorro period to present day. The ramp also doubles as a major vertical circulation element, providing access to the upper levels of the building. Breaking out from the lobby are four different elements, as if leaves originating from the center of the coconut tree. The four elements, different shapes, angles and heights, are organized into the programmatic zones of the building.

Figure 33 Tree of Life diagramming the many uses of a coconut tree.[110]



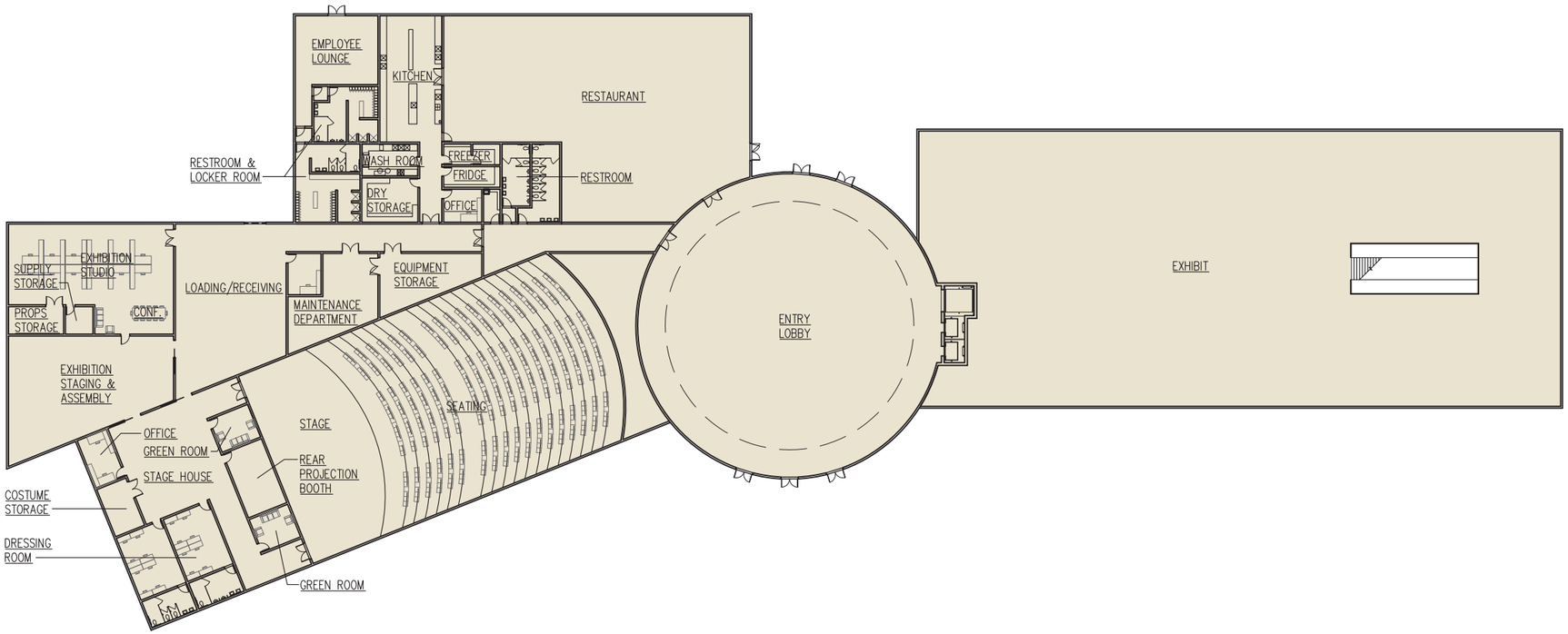
[110] Cunningham, Lawrence J. Ancient Chamorro Society. (Honolulu: The Bess Press, Inc., 1992) 27.

Figure 34 Preliminary sketch of the design.



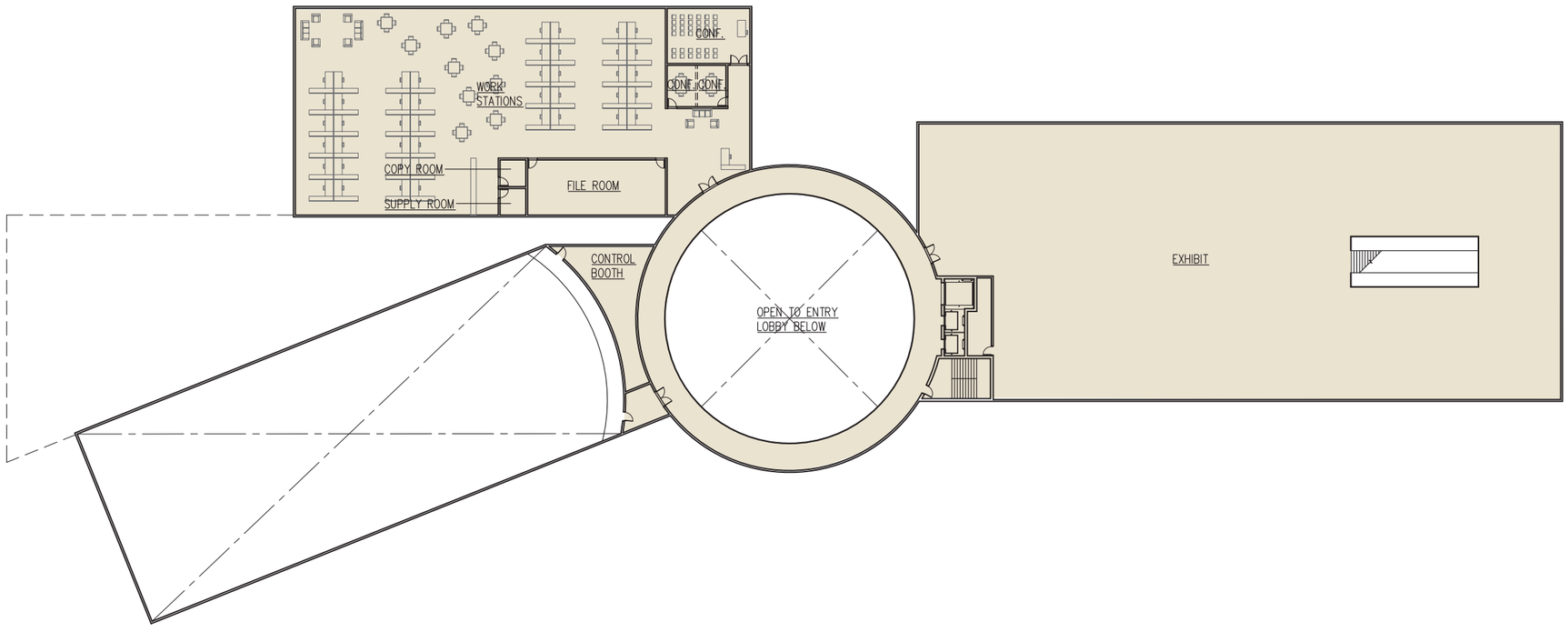
To the east of the lobby was the main exhibit space, as if a coconut in water, it floats above and is comprised of a total of three levels. With a void of 20'-0" below this wing, structural posts unite the building with the earth, as if looking through a coconut tree forest. The only other element touching the ground is the vertical circulation that breaks the continuity of the open aired space.

The western part of the building is divided into three different "leaves". The part closes to the south is a theater, which included the stage and seating as well as the back of house spaces. This large mass is located at this part of the building, to be used as a buffer from the afternoon sun. Primarily formed of solid wall with few windows, it is one of the only programmatic space that require minimal natural lighting.

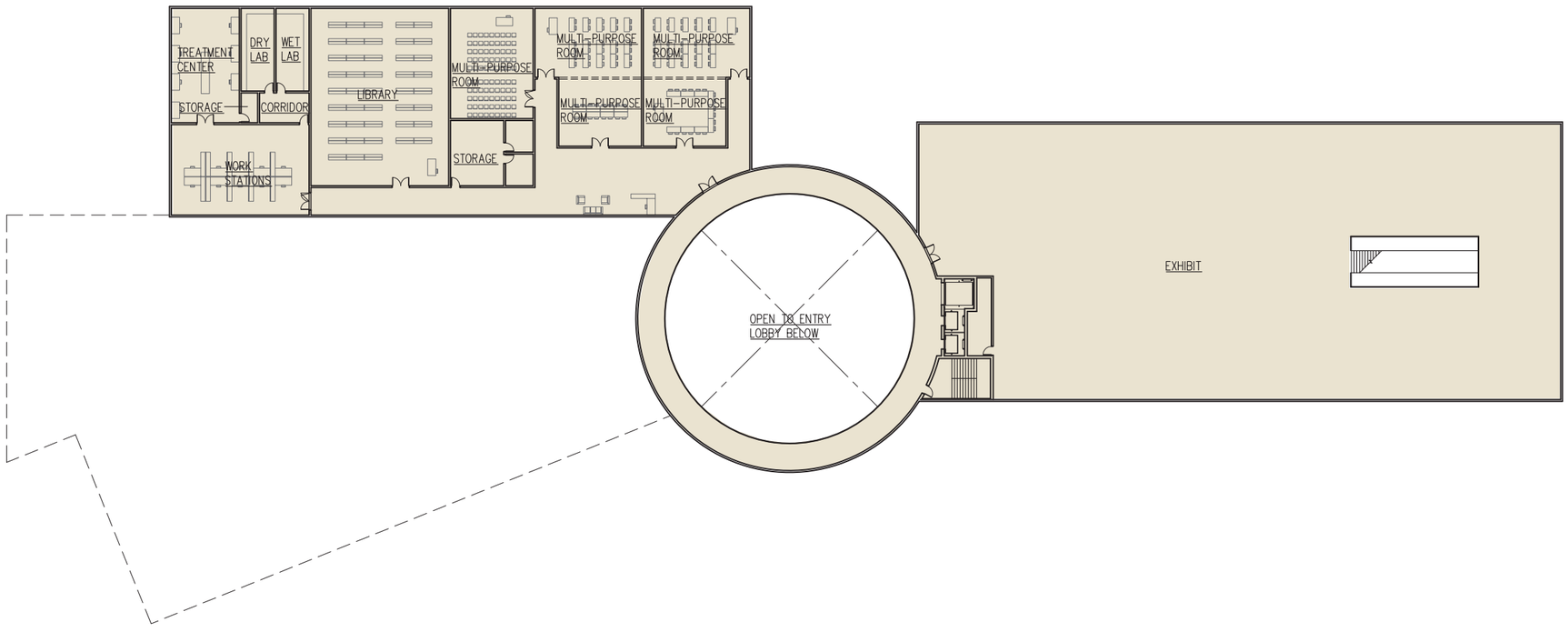


TREE OF LIFE

FIRST FLOOR PLAN



TREE OF LIFE
SECOND FLOOR PLAN



TREE OF LIFE

THIRD FLOOR PLAN

A single story “leaf” is located to the immediate south of the theater, which is where the building service spaces are located. The three spaces in this area are the exhibition studio, loading and receiving and the maintenance department. Although the exhibition studio is a distance from the exhibition wing, it is located closer to the theater, which is where larger objects such as stage backgrounds and props travel back and forth. The loading and receiving fed straight into the studio as well as the theater.

The final “leaf” houses major components of the building, including the remaining cultural spaces, as well as the research and administration zones. Located on the south side, the intent is to take advantage of the ocean views. The restaurant is located on the first floor, allowing visitors to access it straight from the exterior or easily through the lobby. It is conveniently located adjacent to loading and receiving to allow for easy movement of food and supplies. Also on this level is the employee lounge, located at the further corner of the building. The second floor is taken up by administration, while the top level is reserved for the research spaces, including the library, laboratories and multipurpose rooms.

Reaction

It is a very simple layout with a very literal form. The circulation of this design works great, having the major vertical circulation core at the center of the building provides access to each of the zones. It makes it easy for visitors to figure out where they want and need to go. The location of the loading and receiving is important to the flow of the building. Loading and receiving has to service a majority of the programmatic spaces in the building, including the

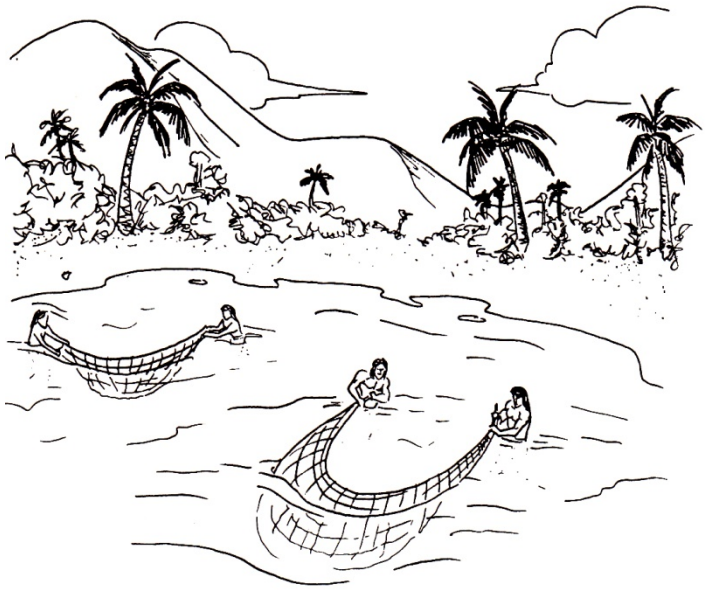
kitchen, theater, collection archive and exhibit. In the Coconut Tree design, the exhibit space is clear on the other side of the building, making it difficult to transport exhibits to and from the spaces.

MANHALLA

The ocean was relied on heavily by the Ancient Chamorros as a source of nourishment. Fishing was a very important part of their custom and a big part of their diet. There were a variety of fishing methods, some which required the use of nets, spears or fishhooks. The Ancient Chamorros had a calendar for the fishing seasons, which identified what fish were in season, thus what fishing method would be appropriate to use. The fishing technique selected as inspiration for this concept is called *manhalla*, a type that uses a net. *Manhalla* is a method in which the fishermen would use a large drag net, *chenchulu*, to block a school of fish.[111] The fishermen would create a hemisphere with the net and drive the fish in towards the shore. This particular technique was selected as a concept primarily for how the movement of bringing something together can translate beautifully into the form of a building. It was this idea of creating a gathering place for visitors to absorb the history and culture of the Ancient Chamorros.

[111] Cunningham, Lawrence J. Ancient Chamorro Society. (Honolulu: The Bess Press, Inc., 1992) 36.

Figure 35 Manhalla fishing technique.[112]



Design

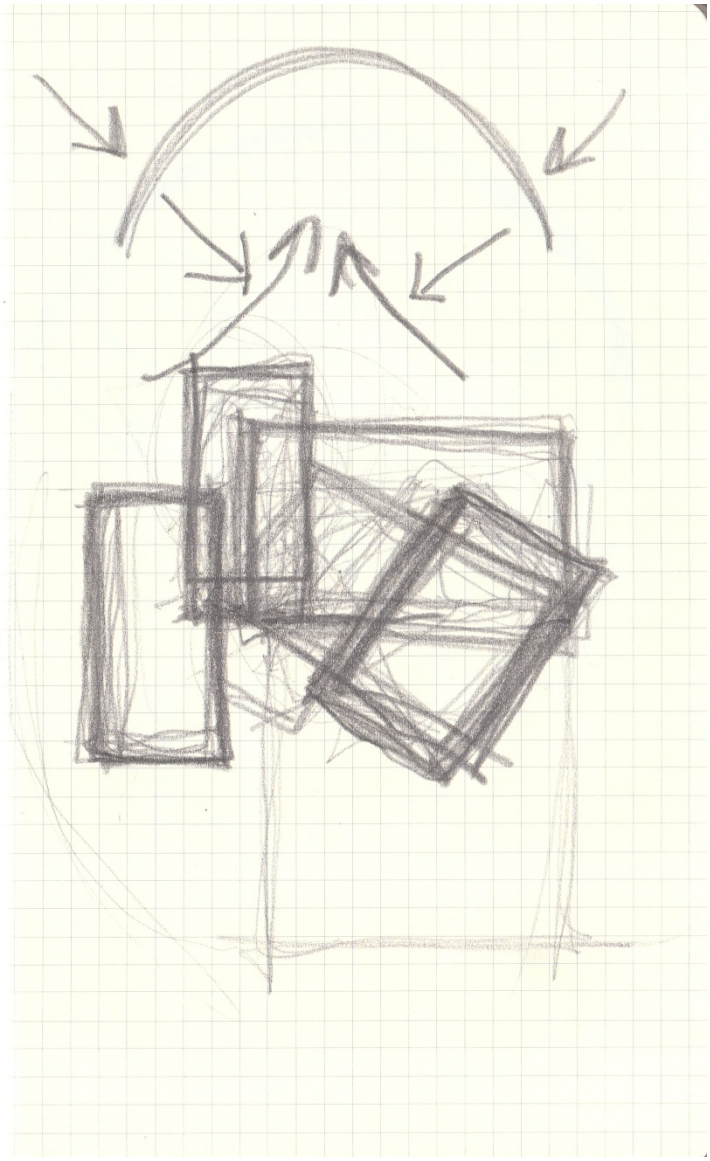
The building is comprised of three forms arranged into a squared off hemisphere, which gathers the visitors and guides them in toward the main entry. The heights of the forms vary with the tallest being in the center, which is six stories tall. Visitors access the main entry through a large courtyard, with a roll of columns to the east angled out that support a mass three stores above. A statement made to push people in towards the center. Along the western part of the courtyard is a shallow water feature to resemble the liquid mass from which fish are caught.

Through the entry, visitors will find the information/ticket desk directly to the left. Continuing into the building, they will be impacted by the tall ceiling that hovers over the remaining first floor main lobby. It is an open air space with large column supports that is the only built barrier

[112] Cunningham, Lawrence J. Ancient Chamorro Society. (Honolulu: The Bess Press, Inc., 1992) 36.

between the building and the ocean. Housed in the area are kiosks that sale trinkets from the Center, as well as a café for refreshments. To the north of the main lobby is a large stair that provides access to and from the exhibits above.

Figure 36 Prelimiary sketch of the design.



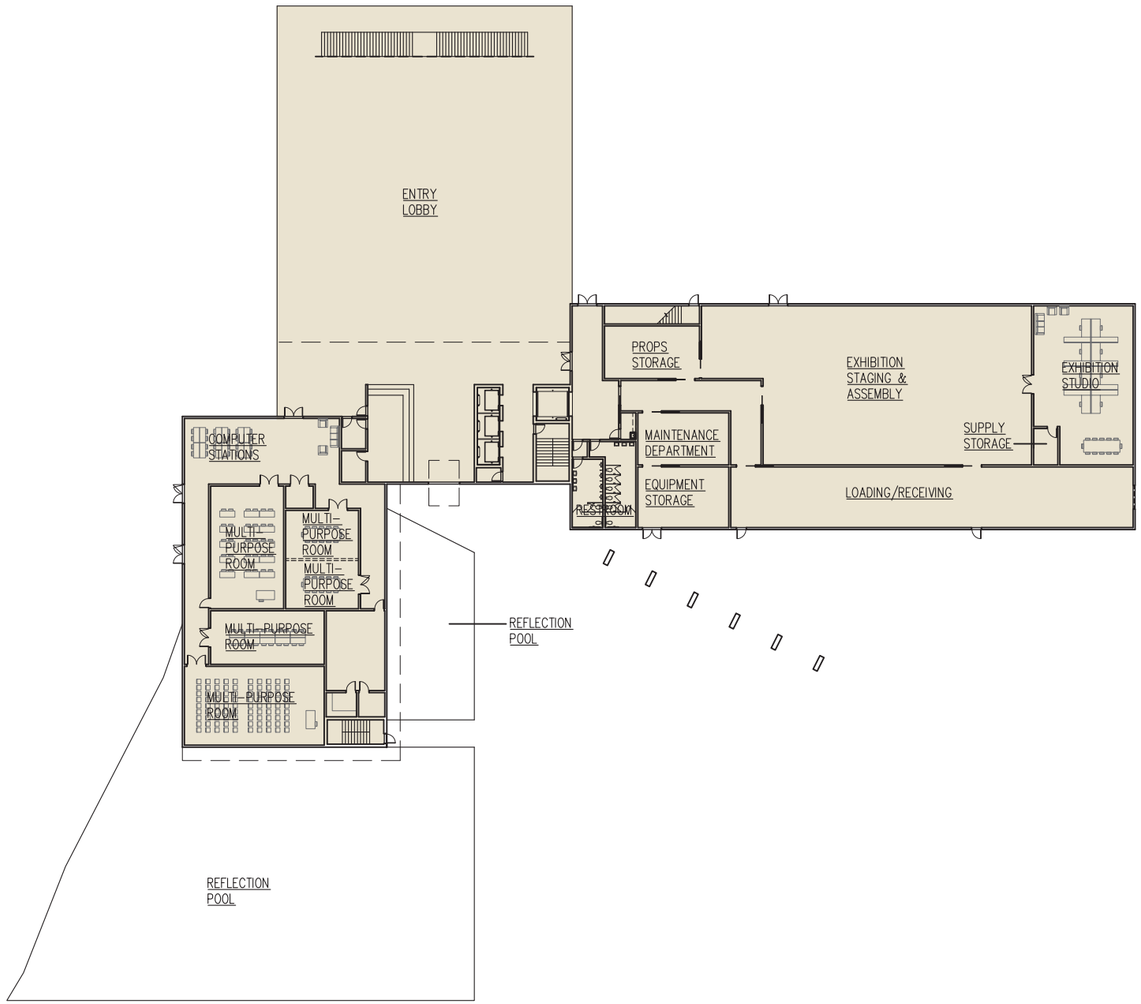
The major building zones are arranged into the design's three forms. The largest form is at the center, with the lobby on the first level and exhibits located above on three levels. A bay of

elevators are located at the southwestern corner of the form, that provides access to all levels/forms of the building. The western form stands three stories tall and is home to the Research Center on the bottom two levels, with the restaurant at the top. The Research Center can be accessed directly from the first floor or from the open air lobby located on the second floor overlooking to main lobby below. The Research Center is divided into two floors, with the public spaces located on the first floor, including the learning center, multipurpose rooms and photography room. The more semi-private spaces are kept on the second floor and include the library at the front of the space and the research center and laboratories to the rear. The restaurant is on the third floor, located high to take advantage of the views. The kitchen is located to the east, while the seating is arranged to the west.

The eastern form stands tall with five levels. This portion of the building includes the Administration as well as part of the Cultural Center. Located on the first floor is the loading and receiving adjacent to the exhibit studio, as well as the maintenance department which has direct access to the outside. It was important to have the exhibit studio's staging and assembly space located on the ground level allowing for easy access to and from the amphitheater located to the north. On the second floor is the theater and back of house spaces. Visitors access this level through the second floor lobby overlooking the main lobby.

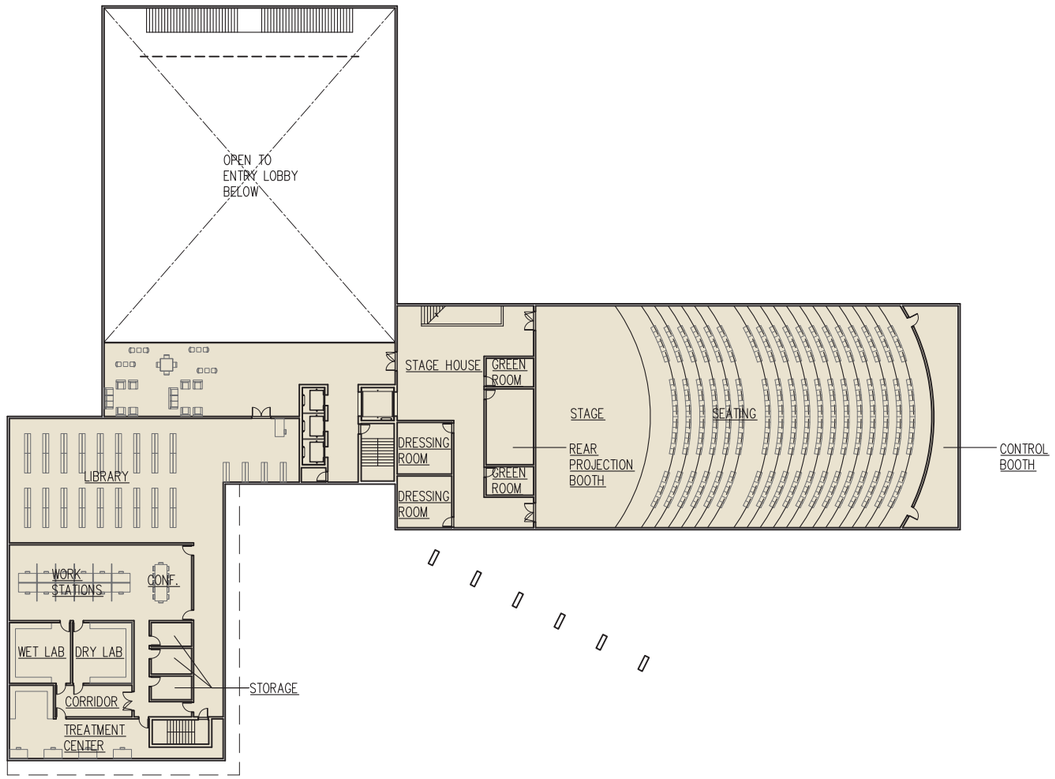
There is a change in form as well as function that takes place on the fourth and fifth floor. To signify the different function of Administration located on these floors, the building rotates towards the west from its axis on the main central form. The space intrudes into the courtyard below, with efforts to move visitors in toward the center. The first level includes the main entry to the space, conference rooms and some of the work stations. The employee lounge is also

0' 10' 20' 30'



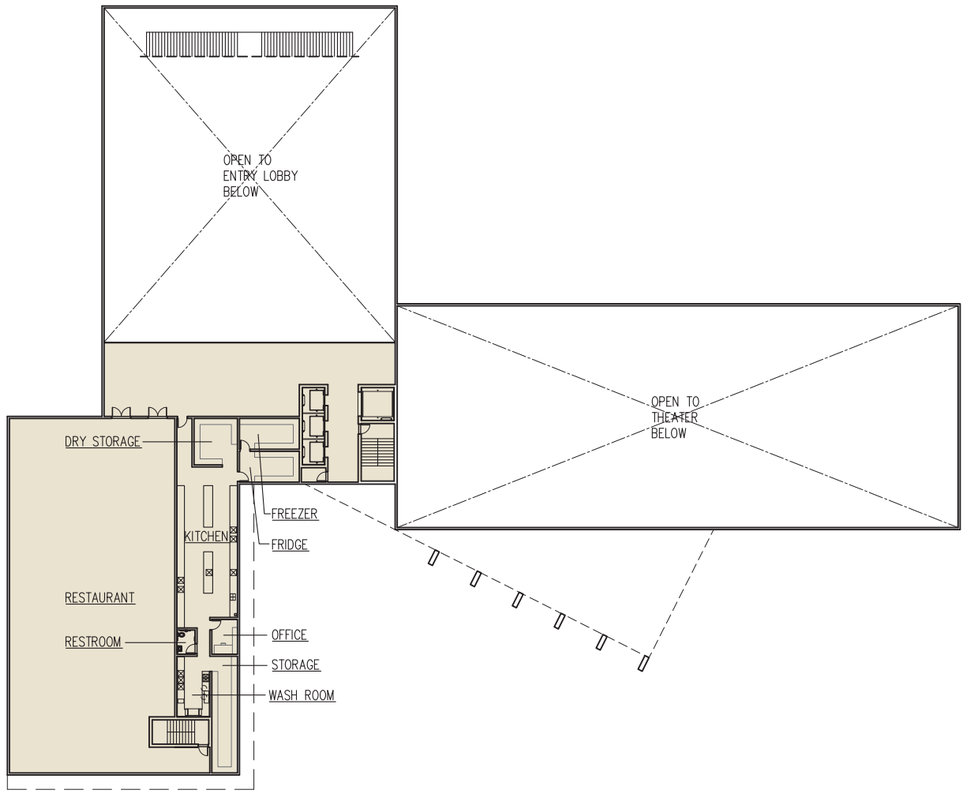
MANHALLA
FIRST FLOOR PLAN

0' 10' 20' 30'

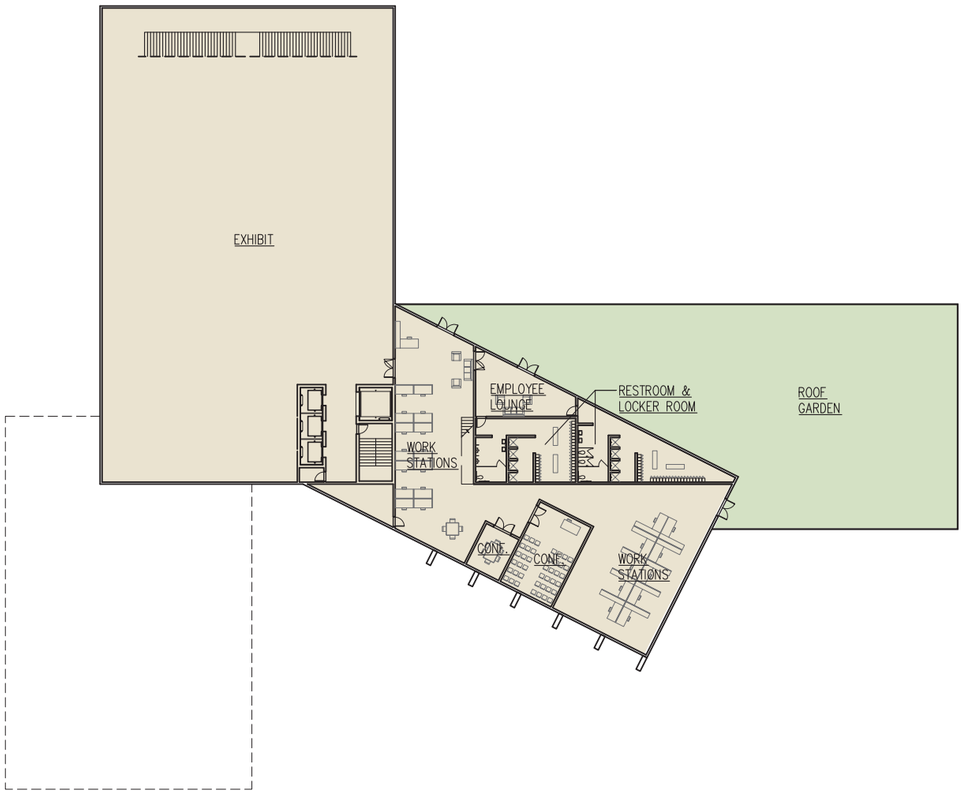


MANHALLA
SECOND FLOOR PLAN

0' 10' 20' 30'



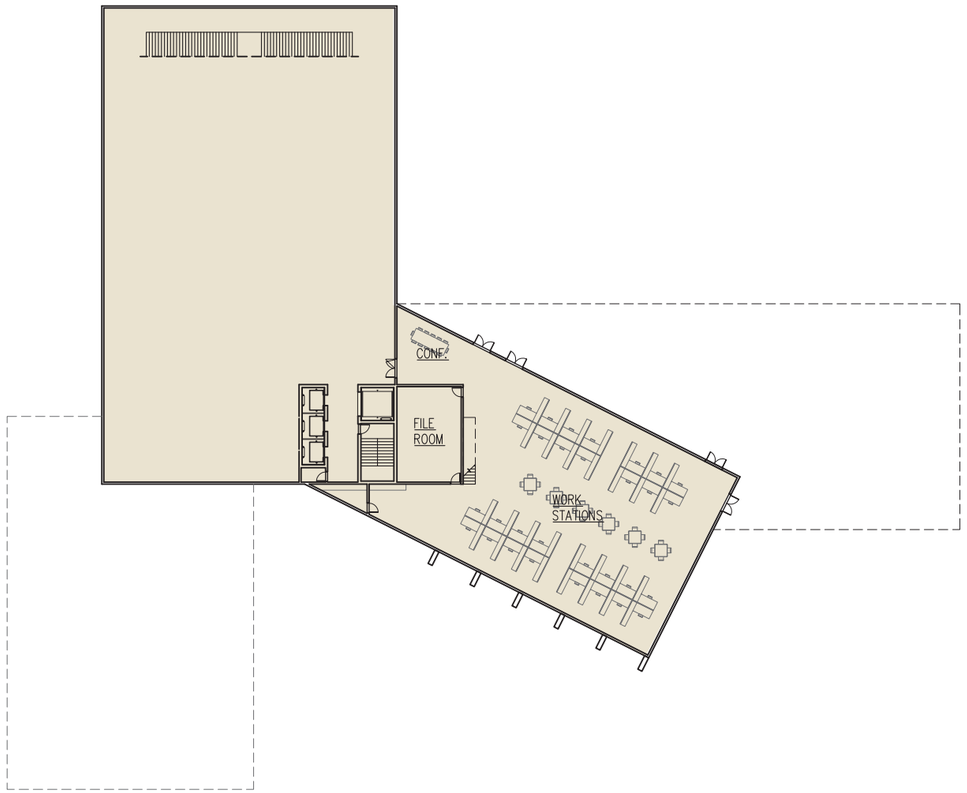
MANHALLA
THIRD FLOOR PLAN



MANHALLA

FOURTH FLOOR PLAN

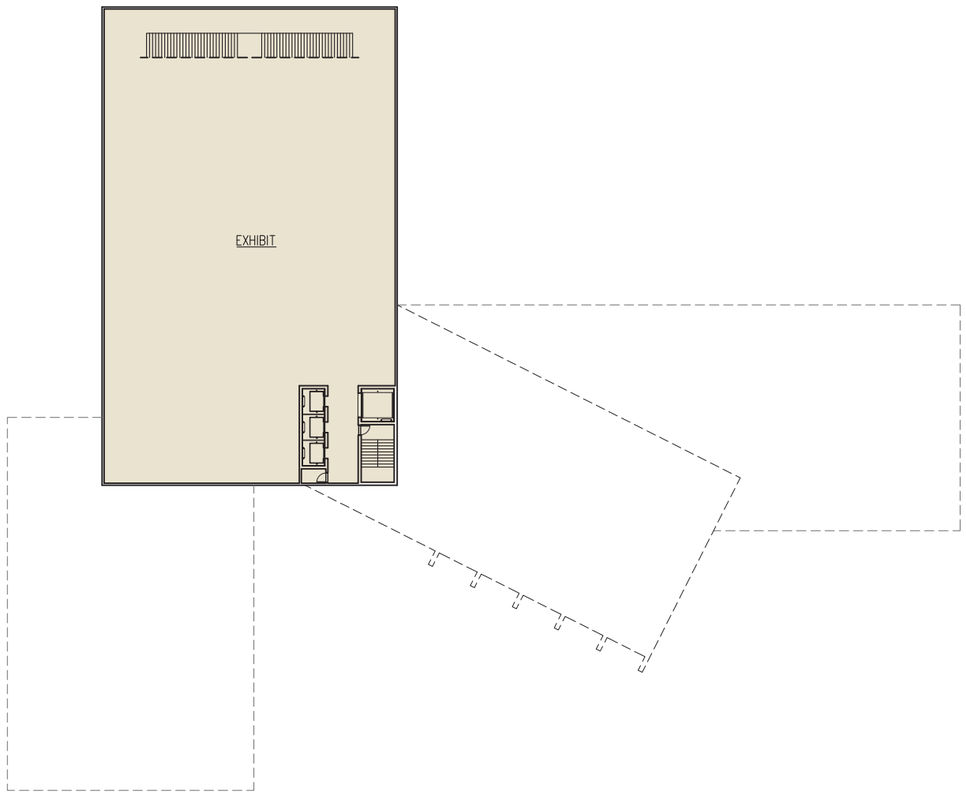
0' 10' 20' 30'



MANHALLA

FIFTH FLOOR PLAN

0' 10' 20' 30'



MANHALLA
SIXTH FLOOR PLAN

located on this level and feeds out to a roof top garden shared with the other spaces. An internal staircase provides access to the second level, primarily comprised of the open work stations, as well as the file area and other secondary spaces.

Reaction

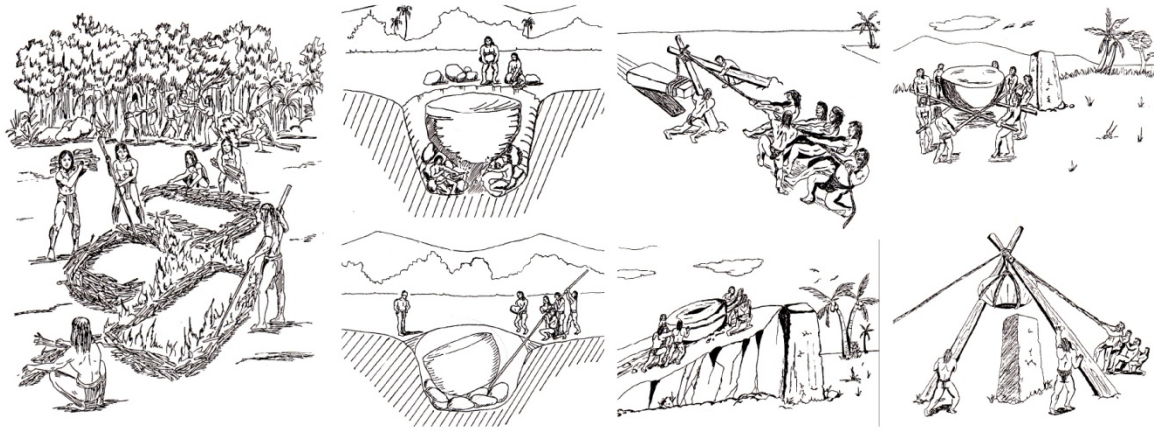
The approach to the Manhalla design is somewhat different to that of the others. In contrast to the other two design concepts, the restaurant is located on the top floor of one of the zones. This allows for a more private restaurant atmosphere and a clear view overlooking the ocean. However, having the restaurant located in this zone proves to be somewhat difficult when moving things to and from the loading and receiving. Another issue with the adjacency of programmatic spaces is the back of house spaces for the theater. It was intended to have this space shared between the theater on the second floor and the amphitheater located on the ground level. Although the theater and amphitheater is located in the same area, it may be difficult for performers to move up and down the levels when performing outdoors.

LATTE STONE

The initial idea was to create an earth sheltered building, perhaps the first modern building that would have been constructed on Guam. This design idea is a way of connecting to the environment and actually carving a latte stone out from the earth. It is to capture the imprint left behind by the latte stone, an imprint that the CCRC hopes to leave behind with its visitors.

With latte stones one of the major artifacts left behind by the Ancient Chamorros, it is often used repeatedly by others as a source of inspiration for concepts that represent Chamorros. Latte stones were definitely an important factor and it would be unfortunate to turn away from this concept because of it's repeated use. To create an unique image, instead of integrating the latte stone concept into something that was upright, the design focuses on *before* latte stones were stood up. It steps back several steps and embraces the process of the creation of the latte stones, the celebration of carving the latte stones from the earth.

Figure 37 Sketches depicting the process of removing the latte stone from the earth.[113]



[113] Cunningham, Lawrence J. Ancient Chamorro Society. (Honolulu: The Bess Press, Inc., 1992) 50-52.

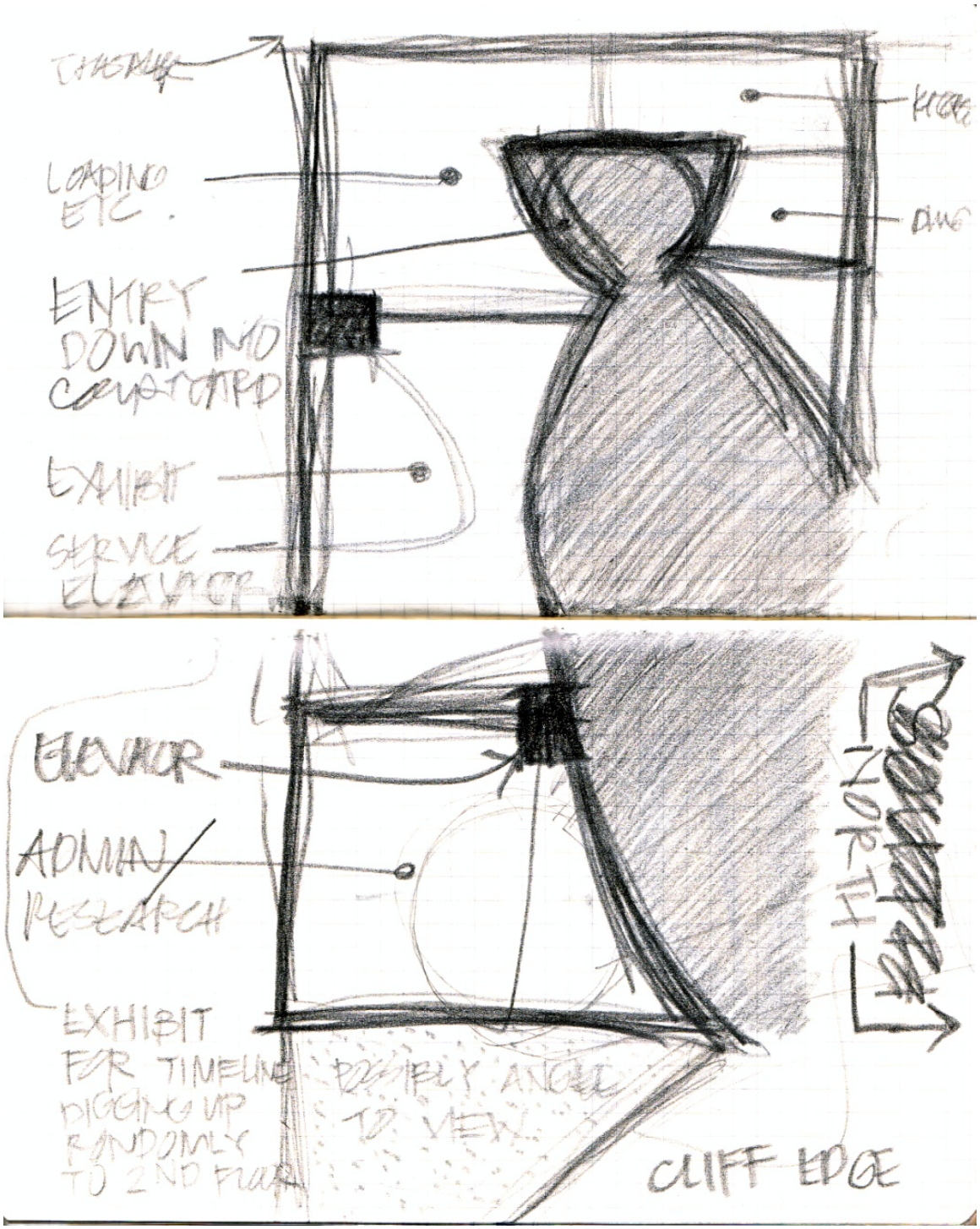
Design

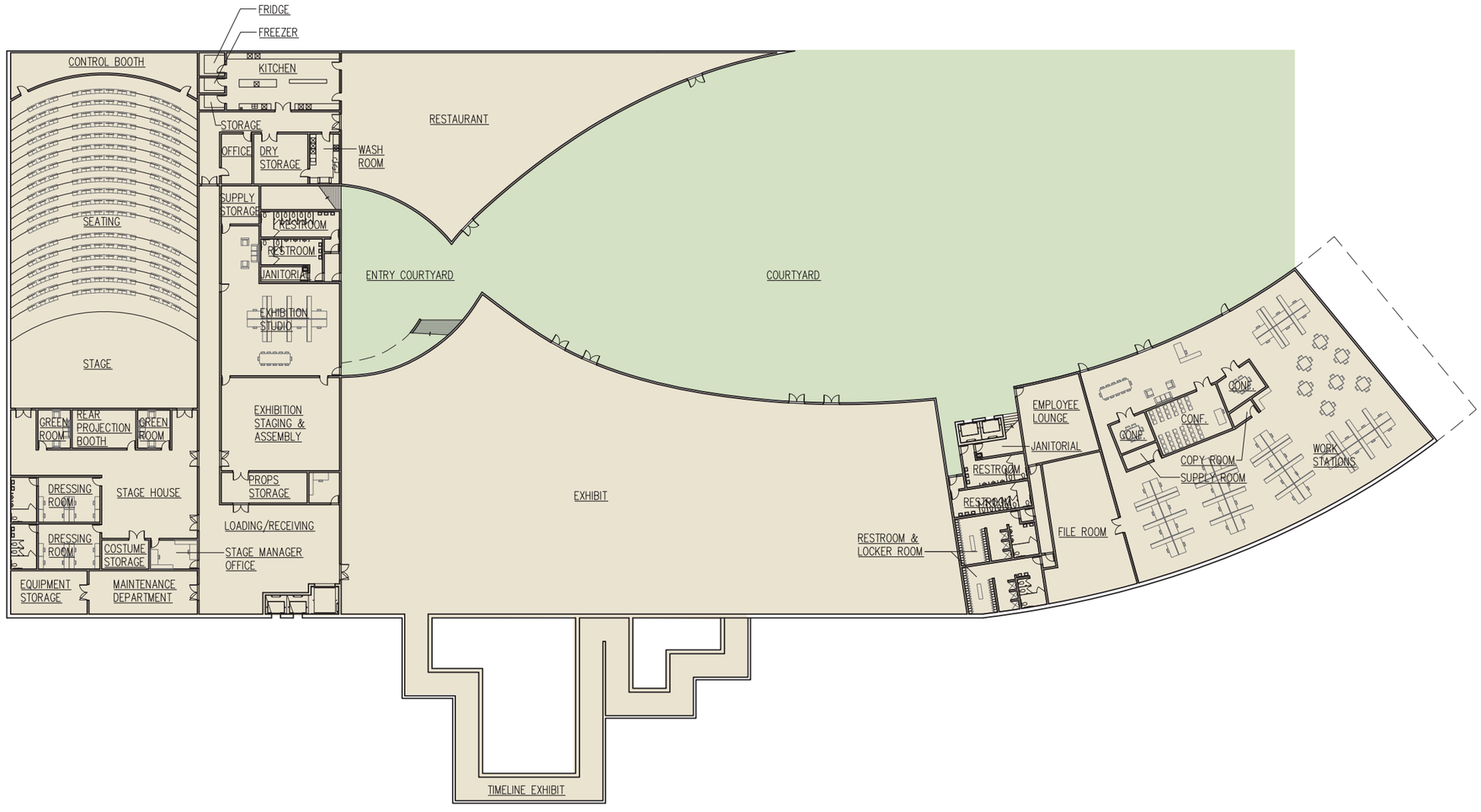
The schematic design of the Latte Stone began with a very literal image. A simple tree story rectangular building with the shape of a latte stone cut out from the center. With the building located below grade, visitors can not see anything from above, but only an area where they can access the building. This idea proved to be somewhat problematic, which will be discussed in the following Reaction. To capitalize on the idea of carving into the earth, visitors enter into the entry courtyard via a ramp that curves down and widens into the space. It is here where visitors find the information and ticket counters before proceeding further into the Center. Once in the main courtyard, there are two options visitors have, to travel down another ramp into the theater, located to the west, or to go to the other spaces located around a larger courtyard. The theater, located to the west, has its back of house spaces adjacent to the loading and receiving, as well as the exhibit studio.

Surrounding the secondary courtyard is the restaurant, exhibit, research center and administration. To the north of the courtyard, visitors will find the single story dining facility overlooking the cliff towards the ocean. The space is located closes to the ocean and is only one story tall, allowing the remaining portion of the building to the rear to still be able to take advantage of the views.

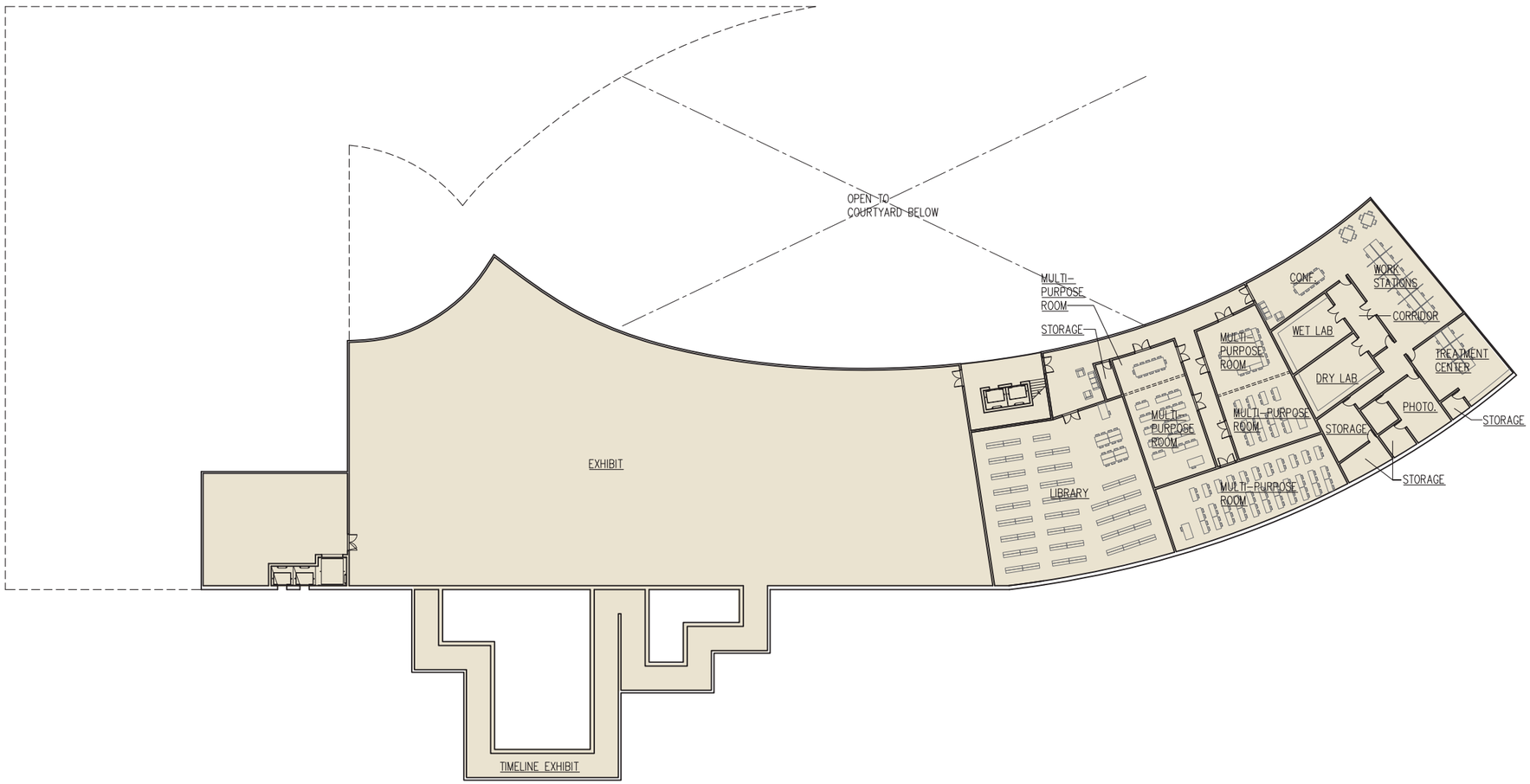
Directly across the courtyard are the exhibit spaces that take up three levels, one level above and one level below. At the south part of the exhibit, visitors can walk through a tunnel space that ramps through the different levels. The irregular shape and narrowness of the space captures the idea of carving into the earth. It is here where the timeline exhibit is located.

Figure 38 Prelimiary sketch of the design.



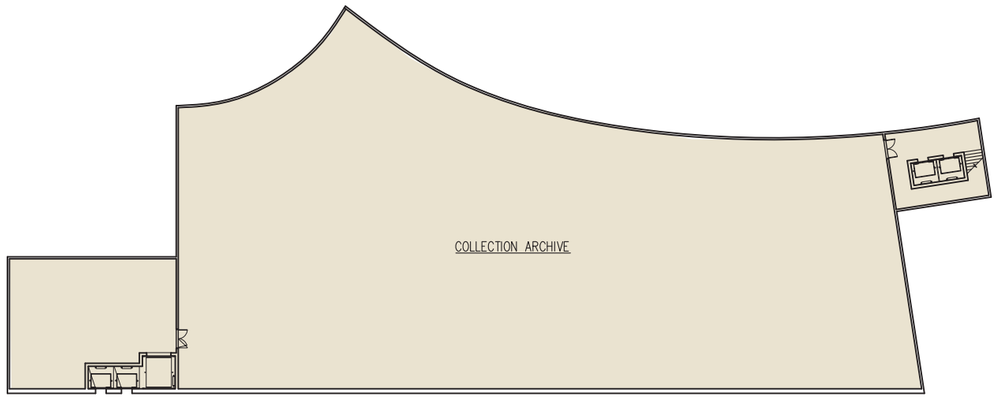


LATTE STONE
FIRST FLOOR PLAN



LATTE STONE

SECOND FLOOR PLAN



LATTE STONE

BASEMENT FLOOR PLAN

To the far east side of the building is the two story Research Center and Administration. Located on the first floor off the courtyard is Administration, as well as the employee lounge. The top floor is the location of the Research Center and is accessed by two elevators that service this part of the building. Upon entering, public spaces are immediately located off the lobby, they include the library and multipurpose rooms. The laboratory and research spaces are located further towards the east in a more private area. To make up for the additional area required for the Research Center, the second floor cantilevers and is angled out over the cliff, framing views of the northern coast of the island and Tumon Bay.

Reaction

Although the concept is very strong, of all the designs, the Latte Stone design has perhaps the most problematic elements. Of these elements, the most important one to be resolved is circulation. With the central courtyards, the building footprint is very large, resulting in the programmatic spaces being spaced apart. For instance, the main entry into the building is clear on the other side of the administration and research areas. This makes it difficult for visitors to know where to go, not to mention the walking distance. Another issue with the design is the lack of an entrance. Because the building is below grade, there is no true entry for which to tell visitors that they have arrived. The idea of ramping down to the entry courtyard is very strong and relates to the latte stone concept of carving out of the earth, however it is not something that is feasible. In reality, the distance of the ramp will be extremely long to travel down. Lastly, the orientation of the building is very important, as it allows designers to take advantage

of the natural elements of the site. However in this case, it is necessary to provide protection from the natural element, wind. The direction of the courtyard has it open to the path of the wind. Although it would be nice to provide natural ventilation, the design creates a wind tunnel that can be somewhat dangerous.

THE CENTER

Concepts have been created and conceptual designs laid out, next step is to select one. One that is the best scenario for the building's function and for the site. Most importantly, one that identifies the Ancient Chamorros and is the foundation of a great design.

Considering the positive and negative qualities of each that was stated in the Reactions, the strongest concept that represents the Ancient Chamorros is that of the Latte Stone. This does not however mean that the design is complete, as previously pointed out, there are many areas that require improvement in order for the building to function properly.

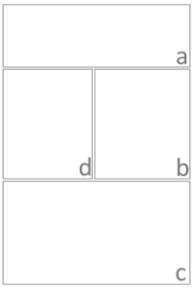
PRECEDENTS

With the 2D portion of the design on paper, another step is to begin creating a 3D version. It is a process of gathering ideas and becoming inspired, whether it was ideas that stemmed from

printed or online sources, or simply by taking the time to look around and see things in a different light to discover how it can be incorporated into the design. With the 3D version beginning to take shape, it allows the design to move forward and use these ideas to iron out the kinks and design in greater detail. It is a process of compiling items that express the shape, materiality and mood of the building. Things that bring it to life.

The following images are exactly that, sources of inspiration that strengthened the Latte Stone concept and helped turn it into something real.


FOOD COURT
Murano Glass



Building Exterior Influences

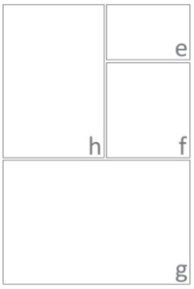
a. An image of the latte stone quarry on the island of Rota. This was the most influential image that strengthened the concept of the Center.

b. There are three primary materials used in the building: glass, metal and concrete. The most dominating is bare concrete, as shown in this image of Art of Ando in St. Louis by Tadao Ando.

c. The food court at a Las Vegas outlet mall. The building is designed on a curve with the glass façade angled out, similar to the effect of the courtyards in the CCRC. The walls around the perimeter of the courtyards are to be angled out and away from the center, implying an idea of being dug out.

d. The Burton Barr Central Library in Phoenix Arizona. The curved form above the main entry into the library is something that inspired the entry for the CCRC.


MARCH



Building Interior Influences

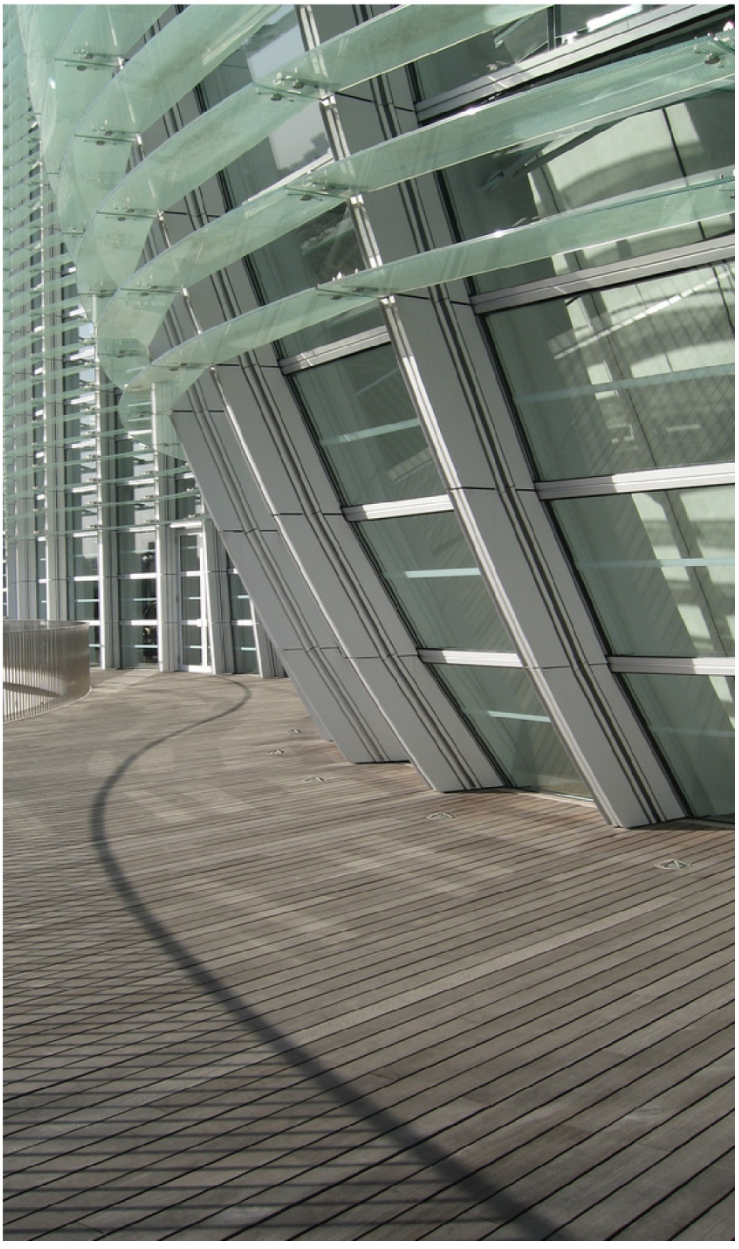
e. An image of an open work stations in an office building. The open layout allows natural light to flood into the building.

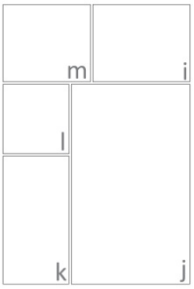
f. Another image of the open work stations, with a gap between the desks and the edge of the room. This allows the gap to become shared space to be accessed by all employees. In addition, it acts as a buffer to protect the desks from the sun rays.

g. The main vertical circulation of Renzo Piano's Nasher Sculpture Center. This is a similar idea employed at the CCRC, instead with the use of escalators rather than stairs.

h. Sidelighting used in this restroom is the same approach used in the exhibit levels. Allowing natural light to enter the space, however not overwhelming the atmosphere of the exhibit.


SCS
2





Sustainable Design Influences

i. Photovoltaics mounted on louvers used by Team Germany at the 2007 Solar Decathlon. Although it was used on louvers, this is the same intention for the horizontal shading devices used in Zone 1.

j. An image of the horizontal shading devices located off the finish floor.

k. A green roof with a sola-tube integrated into the design to provide natural light to the spaces below. This is a similar approach that will be used on the B1 Level, Zone 3, above the Loading and Receiving and Maintenance Department.

l. An image of the bike lane running through a city. Accommodating visitors and employees traveling by bike is one of the sustainable design techniques used in the CCRC. In addition to the standard driveways for vehicles, the Center also provides a bike lane.

m. An image of quiterevolution wind turbines installed in a mall parking lot. Similar to this image, the driveway at the CCRC will be lined with wind turbines instead of trees.

DESIGN

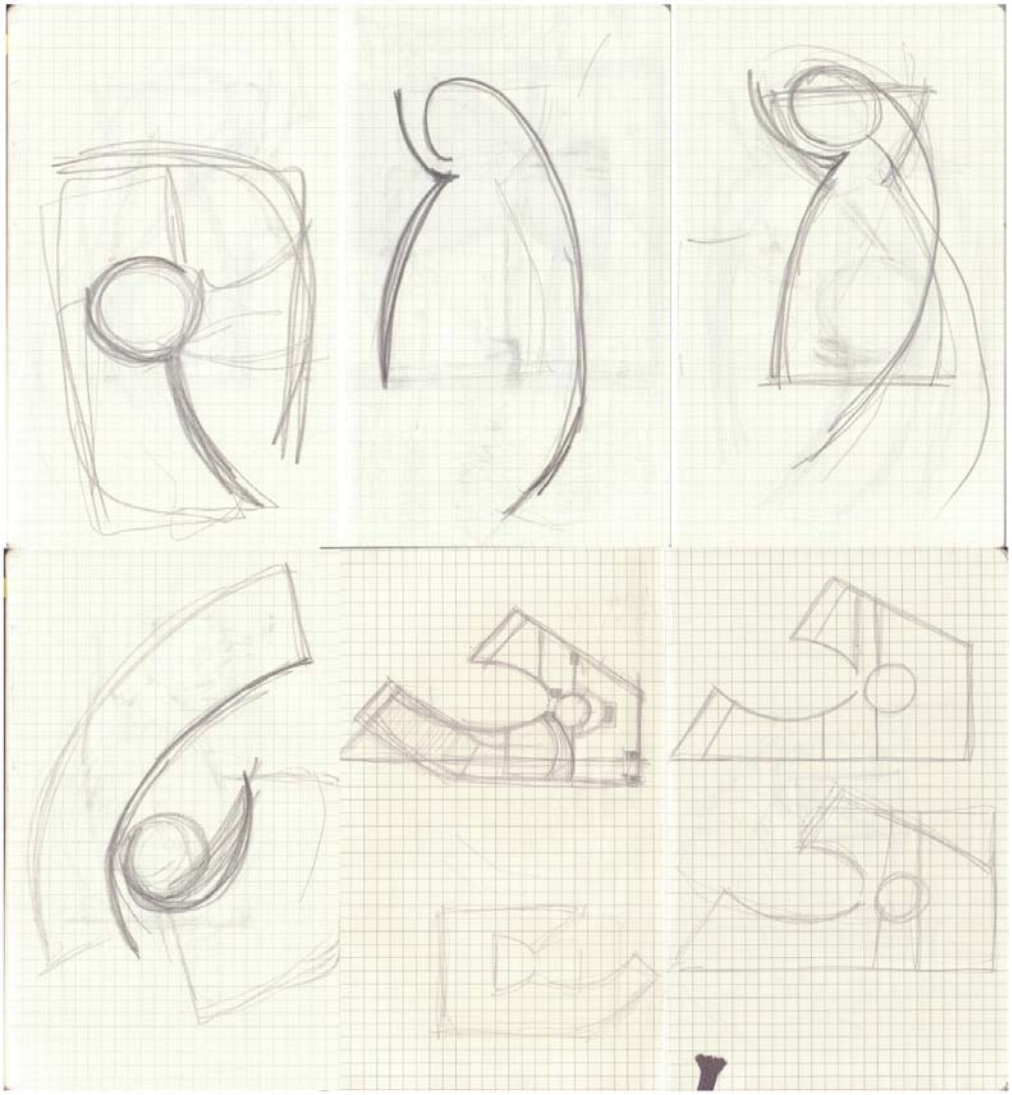
Progressing forward with the Latte Stone concept required many changes to the conceptual design. Almost everything was modified, with the exception of the concept and courtyards it created in the earth sheltered building, but that too was slightly revised.

Going back to the initial idea of carving out the latte stone and leaving the imprint on the earth required further investigation. The main source of inspiration was the latte stone quarry in Rota. Images of the site show that the latte stone parts, *halege* and *tasa*, were carved from the earth separately, rather than as one piece as suggested in the conceptual design.

Figure 39 Photo of the Rota latte stone quarry.

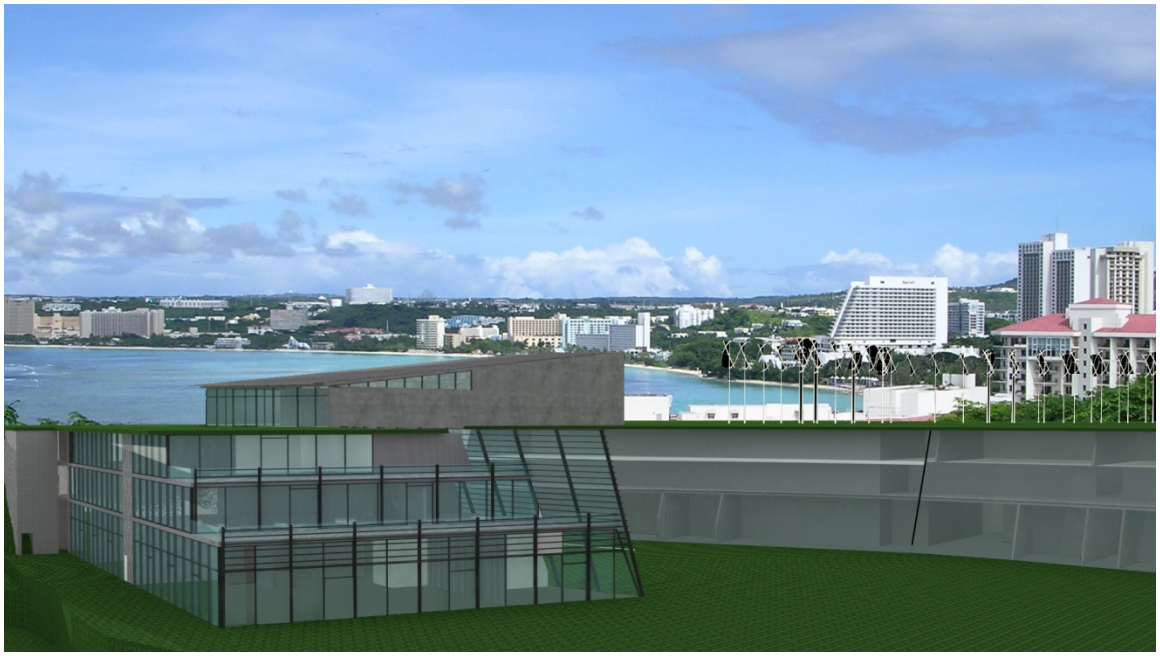
It was important to be realistic and replicate the image instead of being literal and carve out the actual shape of the latte stone. This required that the *halege* and *tasa* courtyards be separated completely and to adjust their shapes to resemble the true imprints left behind in the earth. The *tasa* courtyard became more of a circular form as if viewing the part from above, rather than from the side. Also shown in the image is the earth left behind in between the imprints.

Figure 40 Sketches.



This provided a perfect situation to locate the main vertical circulation of the building. It was a large linear space that separates the courtyards while also uniting the building. Circulation proved to be one of the major problems in the conceptual design, having a central space dedicated to vertical circulation resolved the issue.

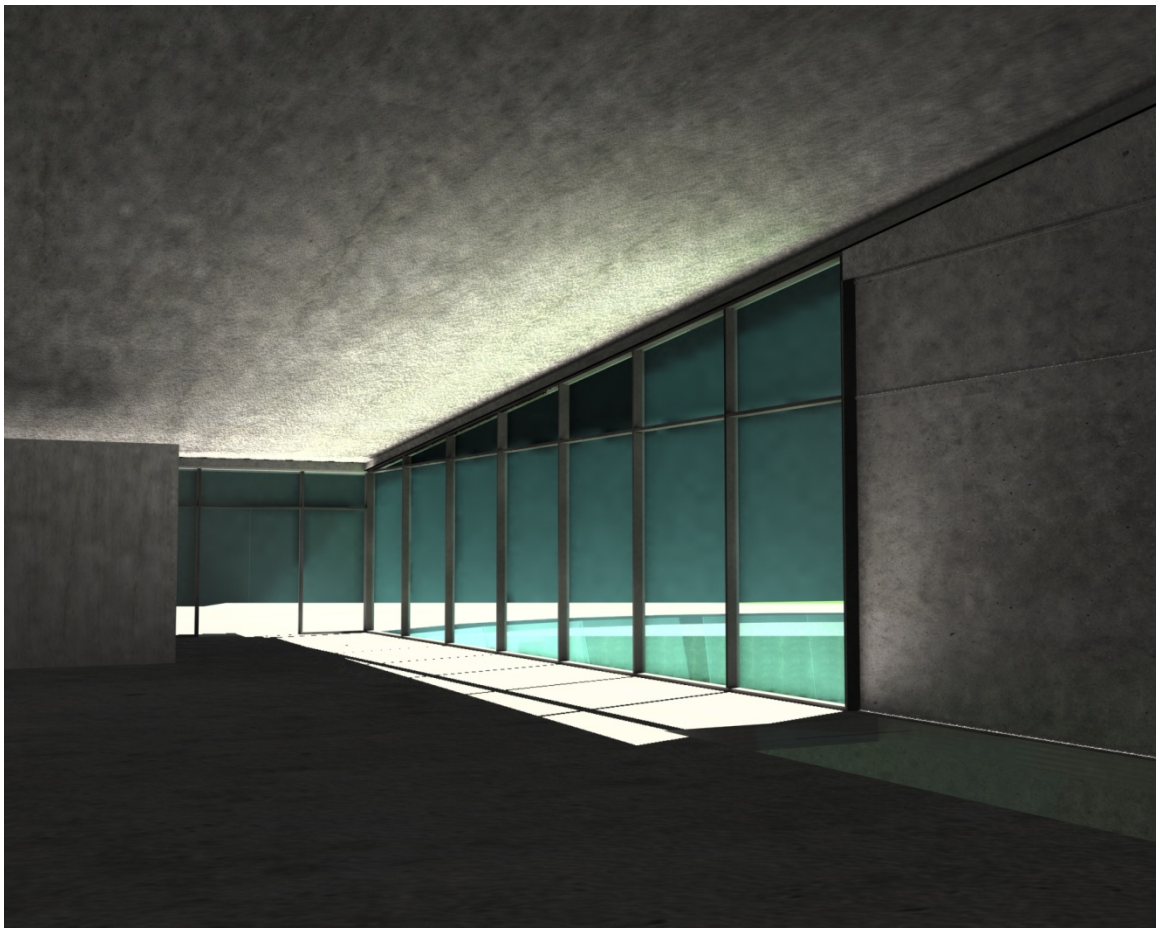
Figure 41 View of the CCRC from the northwest.



Another obvious change was the direction of the courtyard. Previously in the conceptual design, the courtyards were open to the path of the wind and overlooked the northern part of the island and Tumon Bay. Natural ventilation is important, however in this case, the courtyard would have created a tunnel like effect and wind would be harsh in the space. To provide protection from the wind, the building was mirrored allowing the courtyard to face the southern part of the island. This was an important quality in that the building is directed to the historical villages of Guam, the island's capital, Hagåtña, as well as Umatac, the southern village where it is believed the first contact with the outside world took place.

The goal of the design was to create a building that left an imprint on the earth and it's visitors. However, in order to accomplish this, it is important that the building's presence from the street is not overwhelming. The only thing above grade is the main entry and lobby, a structure that identified where visitors should go. Everything else was below, including the parking.

Figure 42 View of the main lobby.



Visitors arrive at the building by vehicle through a long driveway lined with sophisticated wind turbines instead of trees. Those who wish to park can take a left to access the parking structure, all others may be dropped off at the loop before the main entry. There are also bike lanes and pedestrian walkways on either side of the driveway for those not traveling by vehicle. To

strengthen the idea of carving into the earth, visitors who park below have to travel up an elevator to the main entry. This allows them to travel down into the earth through the main lobby. Stepping through a transition lobby under a curved wall of photovoltaics, one enters the main lobby, where there are the information and ticket counters in the open space. To access the floors below are two sets of escalators on either side. Or one may take a bridge like feature to the elevators to the north. The elevators, strategically located in front of the sweeping ocean views, intrigues visitors to continue beyond and experience nature and step onto the roof top garden and enjoy the scene.

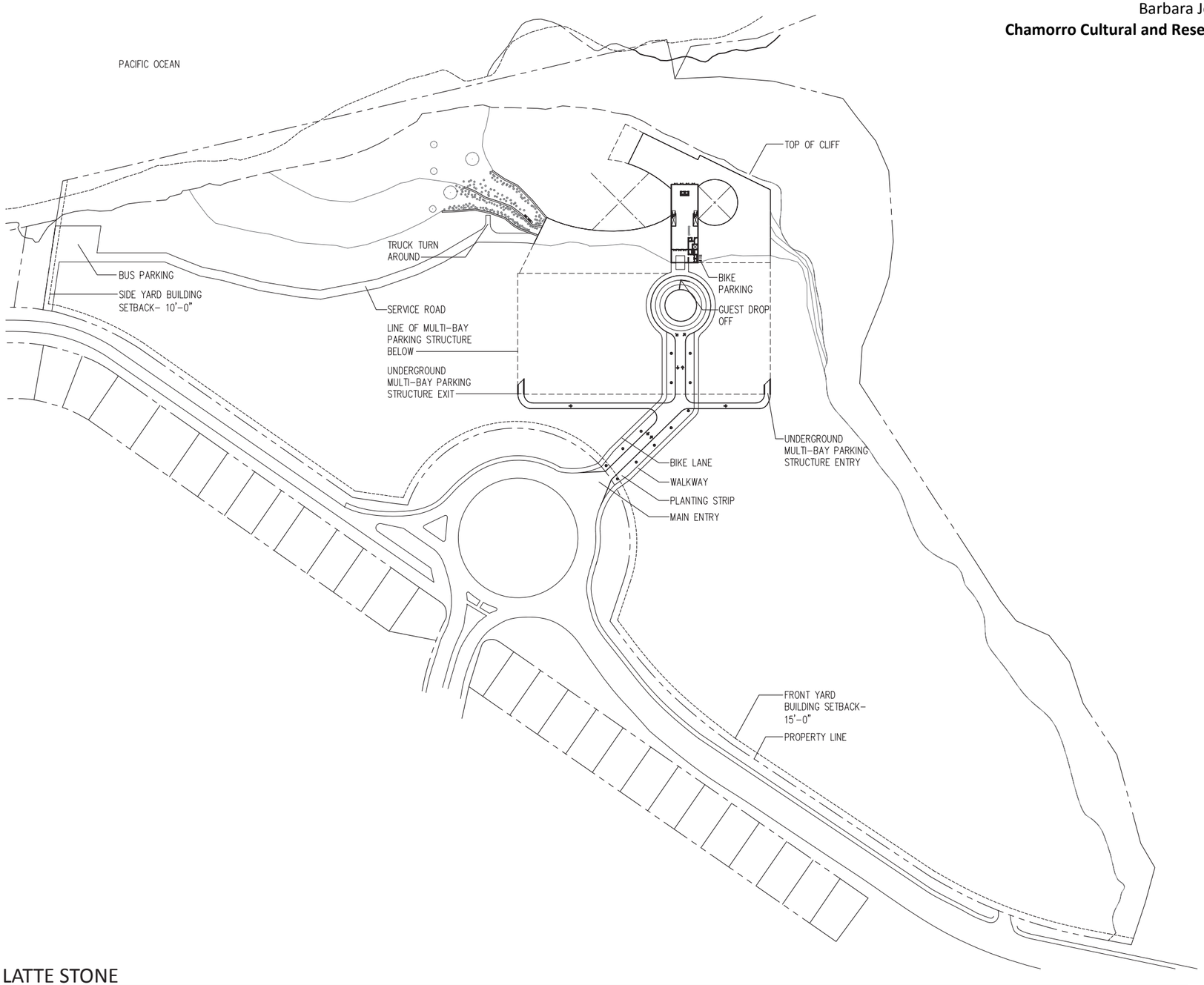
Below the Entry Level are four levels, B1, B2, B3 and B4. As mentioned in the program narrative, the building is divided into three zones, the Research Center and Administration (Zone 1) is located to the north, while the Exhibit (Zone 2) takes up the eastern part of the building. Along the south is a combination of the Cultural Center and Services (Zone 3).

Level B1 is located immediately below the Entry Level and is more of a service floor. Visitors taking the escalators continue pass this floor onto Level B2. To the west of Zone 3 is the loading and receiving, which is accessed via a service lane located at the western part of the property. This feeds directly into the maintenance department and around the wide corridor is the mechanical room. The only other occupiable space is in Zone 1, where the top levels of the Administration and Research Center is located. Both the Administration and Research Center spaces are divided among the three floors located in this zone. On B1, these spaces are accessed via the elevators or internal stairs. The Research Center's library is located in line with the circulation lobby, while to the west is the employee lounge and outdoor lanai.

Level B2 is entirely occupiable in all zones. In Zone 1, open work stations take up a majority of the Administration, as well as an outdoor lanai. This level of the Administration is access via an internal vertical circulation system. The Research Center is located directly off the circulation lobby, where visitors will find on this level the conservation workrooms, laboratories and treatment center. The treatment center is along the exhibit space, allowing visitors to observe the events taking place in the center. Zone 2 is comprised of the exhibit spaces that overlook onto the open air exhibit space in the courtyard below.

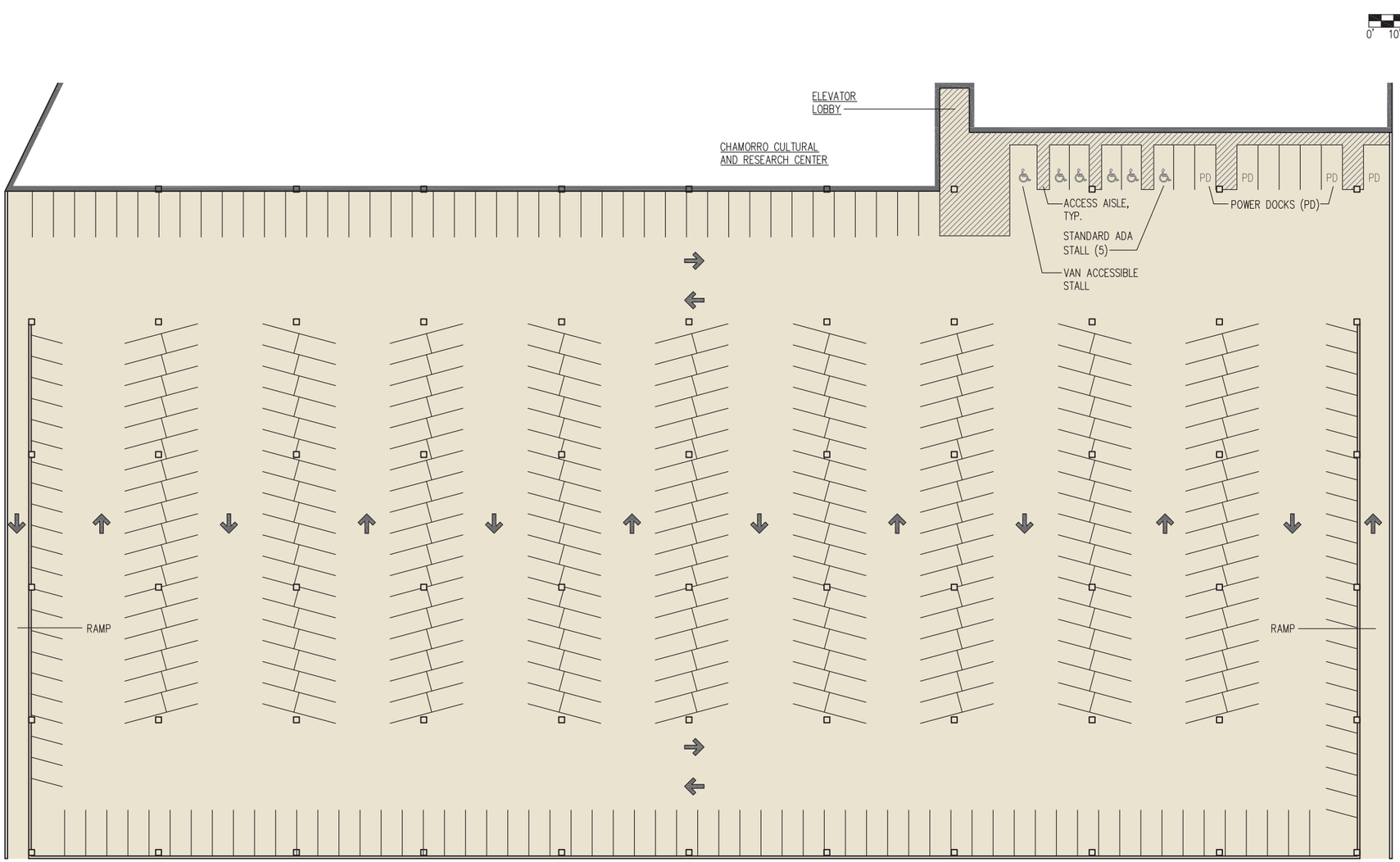
Also located on this level, in Zone 3, is the theater, which has it's main entry off the circulation lobby. Visitors would travel through the theater's lobby directly into the seating area. Instead of entering the theater, one can continue west into the bar and further into the dining facility. The kitchen is located in the southwestern corner of the building. Due to the sloping grade, there is access out to a terrace with a native plant garden used by the kitchen.

The courtyards are located off B2 Level and are accessed through the circulation lobby. The western courtyard is used for outdoor performances and adjacent to the space is the theater's back of house and exhibit studio. This allows the performers to share the space. The courtyard to the east is used for the open air exhibit. The bottom levels of the Research Center and Administration is located in Zone 1. Both of the spaces are accessed from the circulation lobby. The Research Center is comprised of the multipurpose rooms, while the Administration includes additional work stations, as well as conference rooms and a breakout center. Immediate off the circulation lobby is the shop, which also exits out onto the western courtyard. Lastly, on B4 Level is the lower floor of the exhibit in Zone 2 and the collection archive and mechanical room in Zone 3.



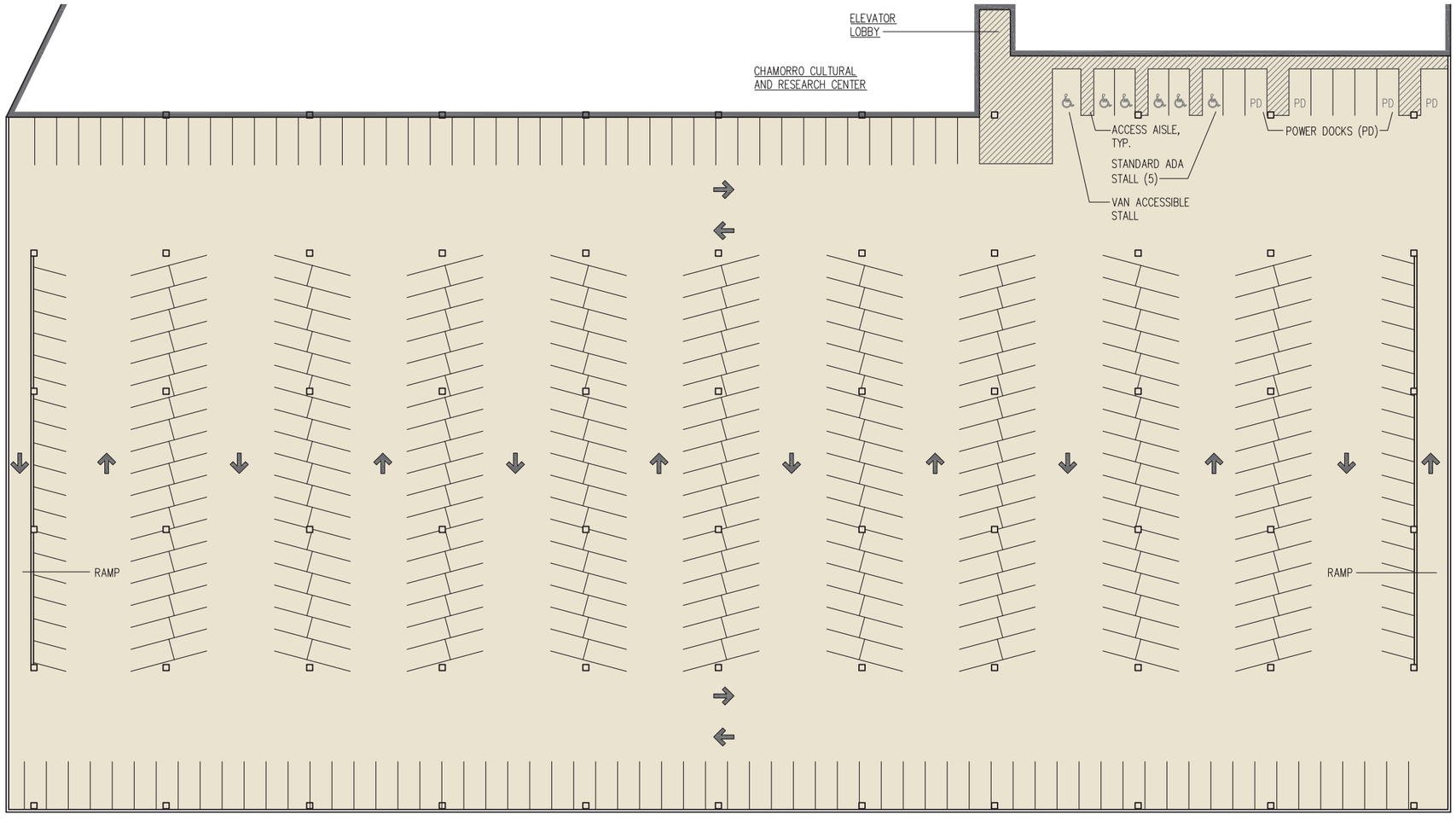
LATTE STONE

SITE PLAN



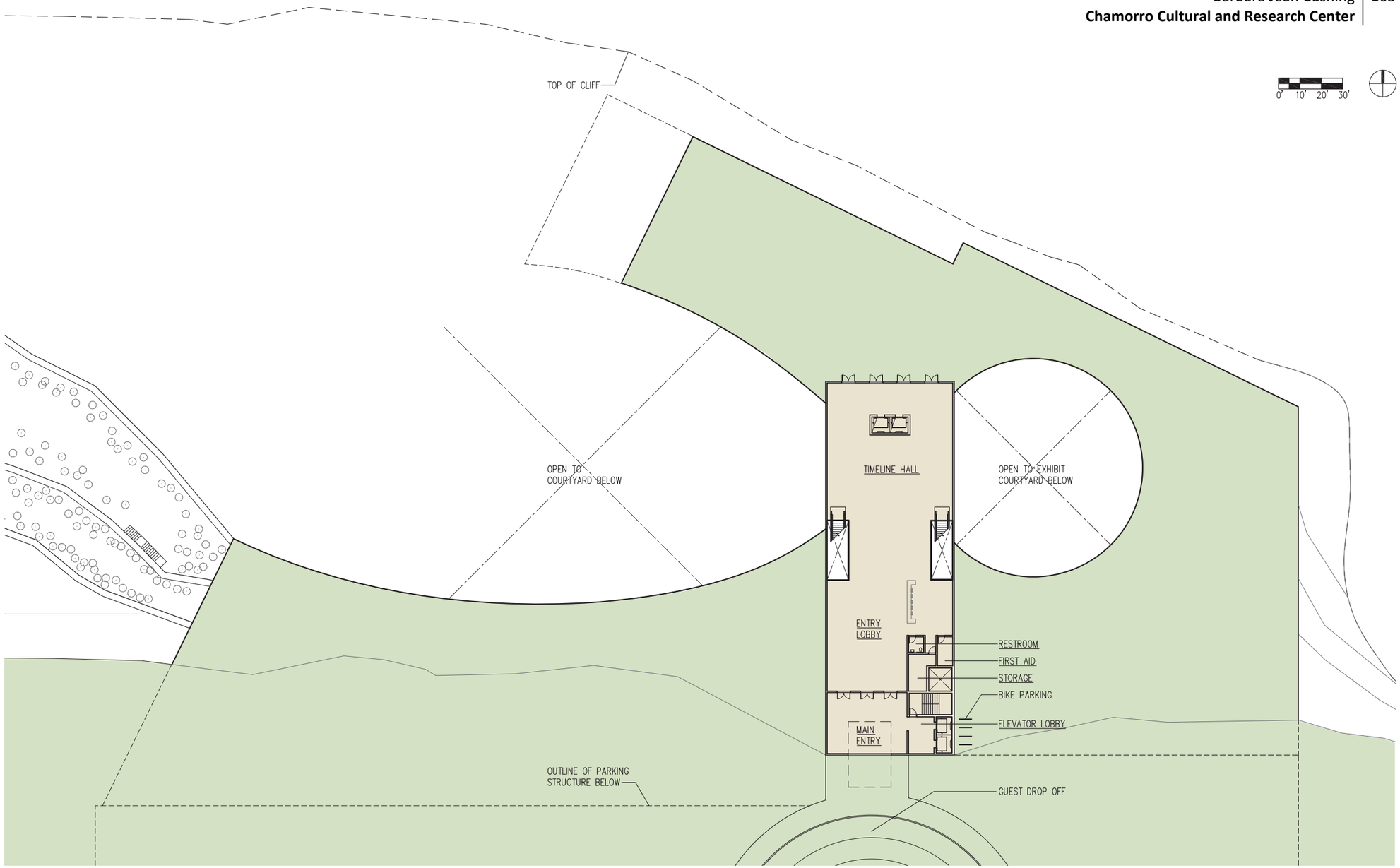
LATTE STONE

PARKING PLAN A

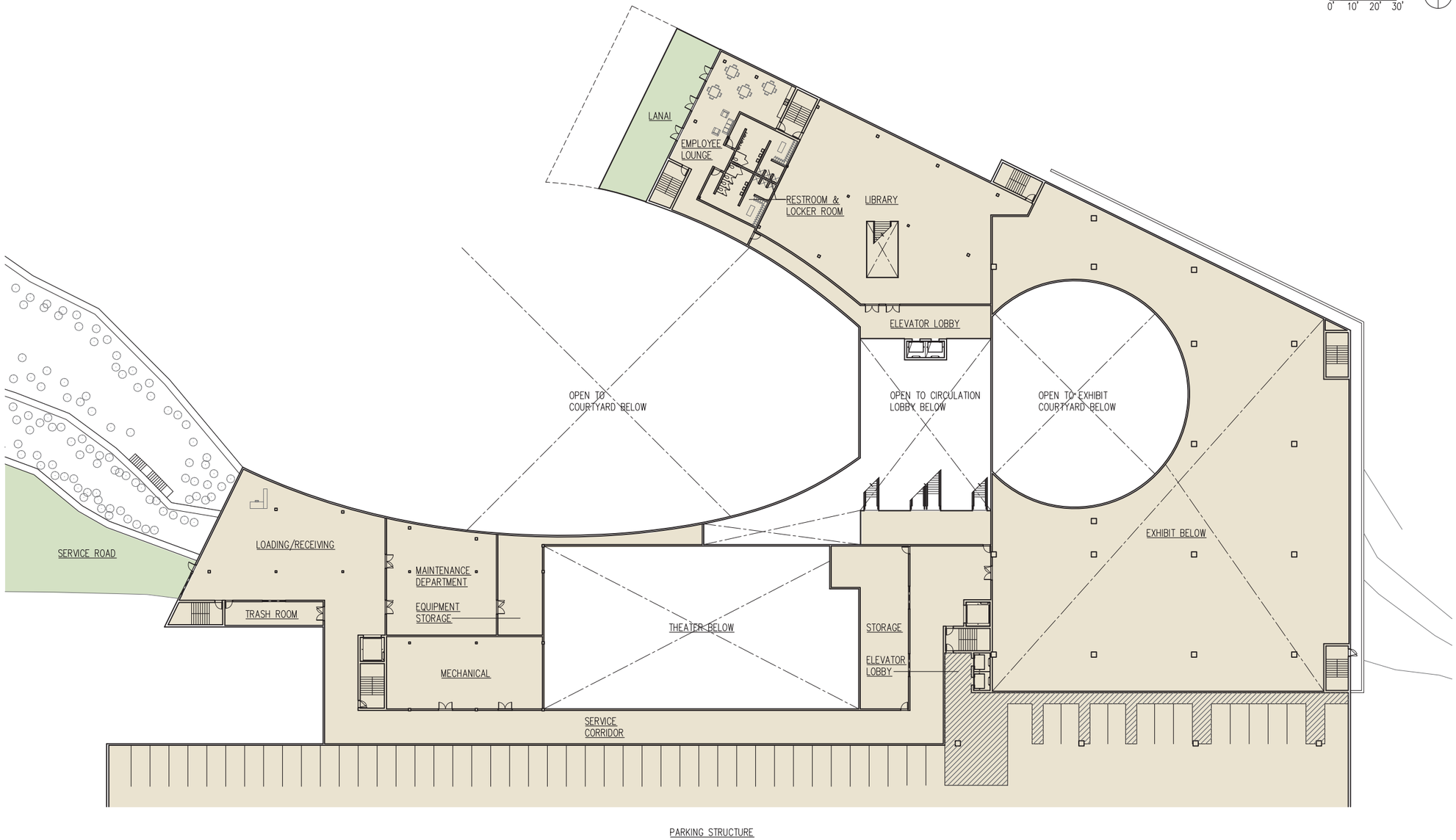


LATTE STONE

PARKING PLAN B

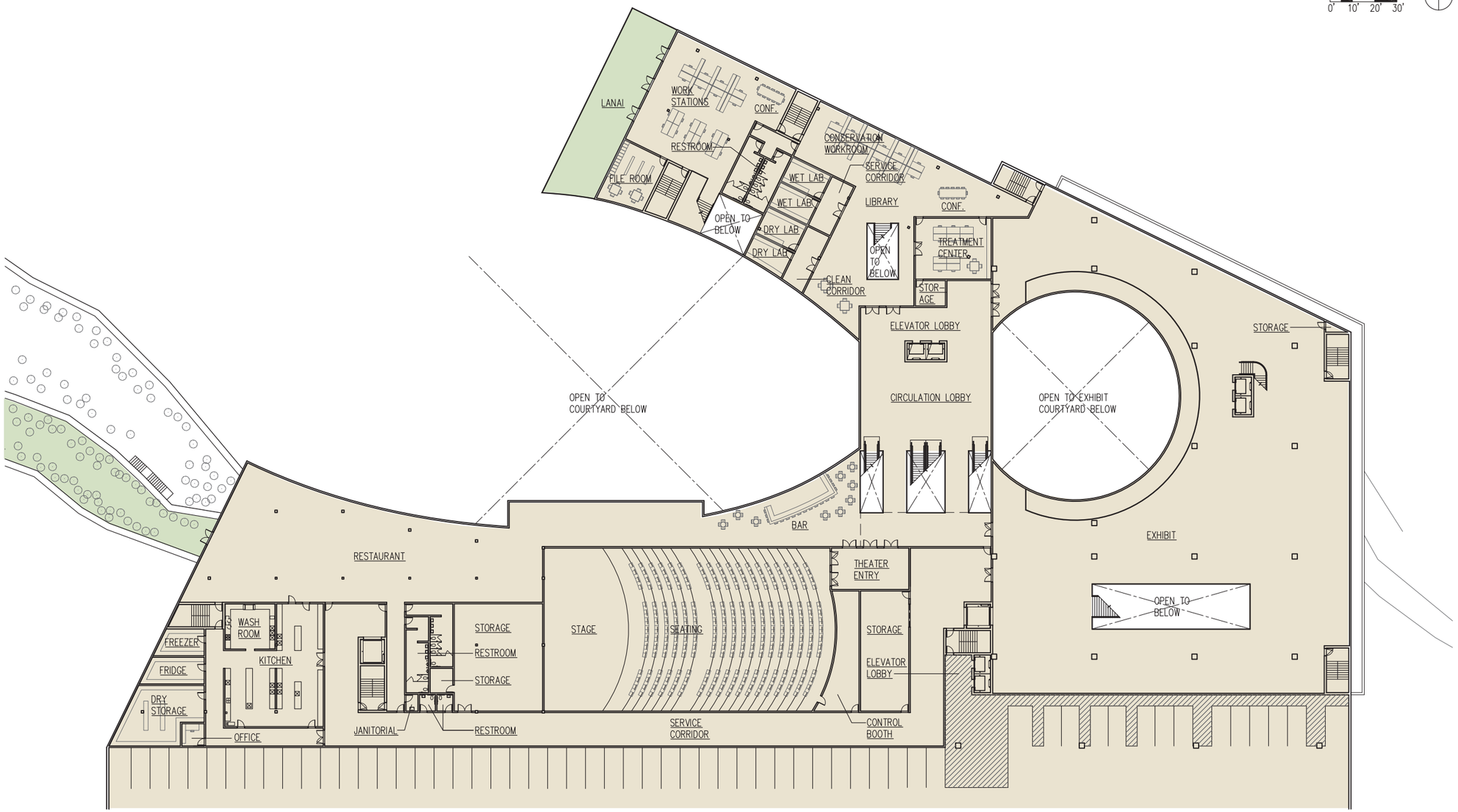


LATTE STONE
ENTRY LEVEL



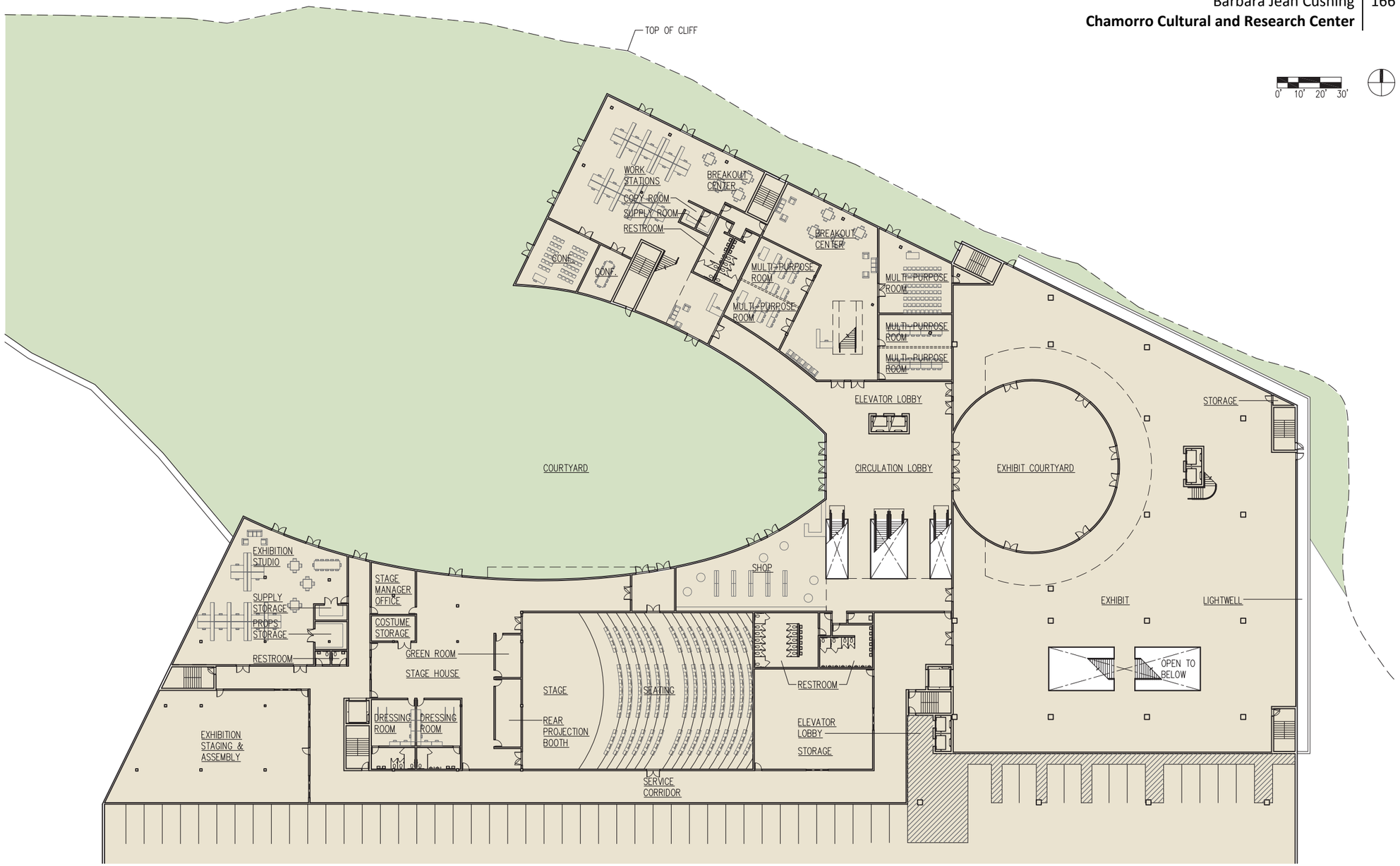
LATTE STONE

LEVEL B1



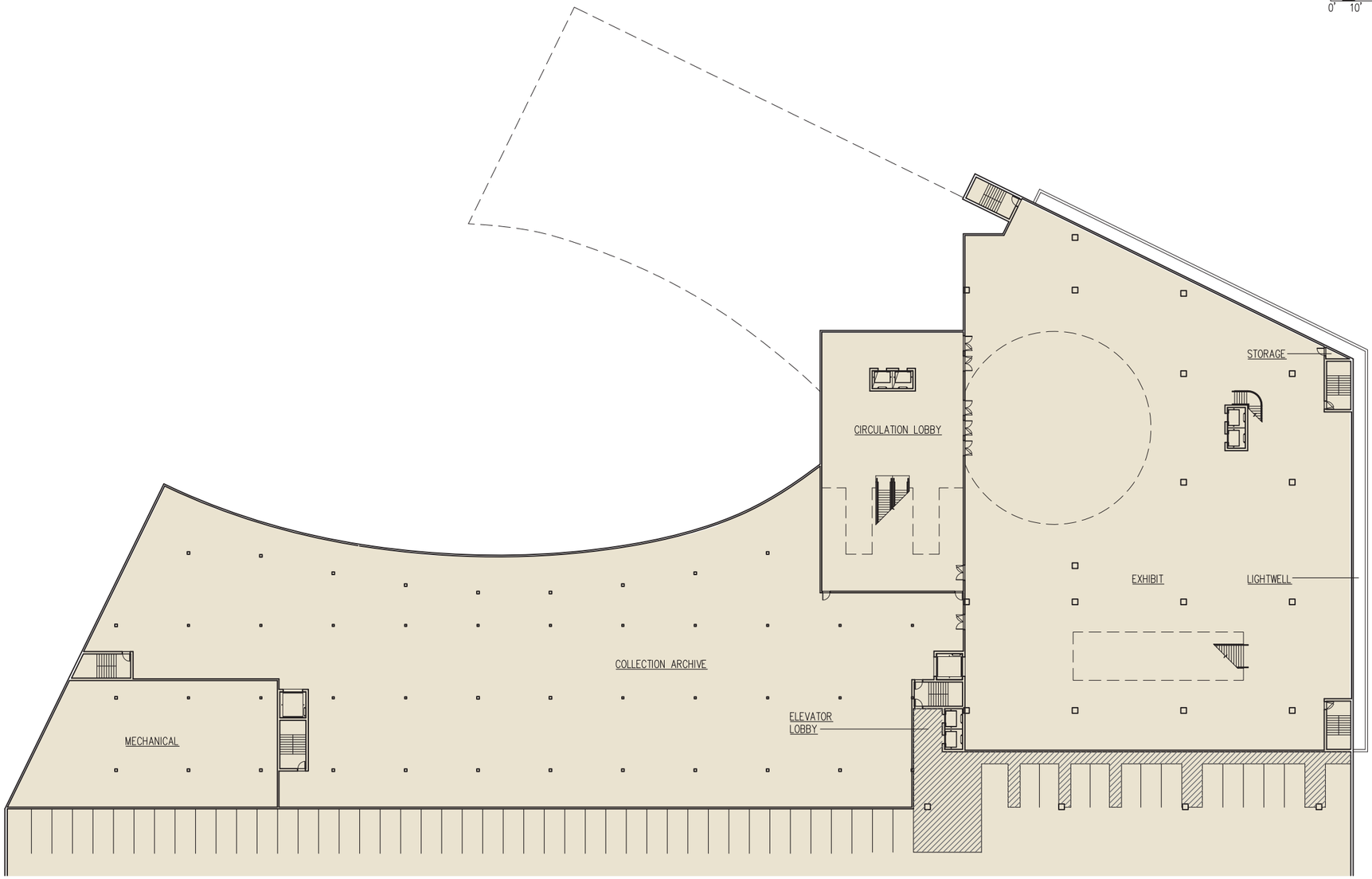
LATTE STONE

LEVEL B2

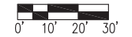


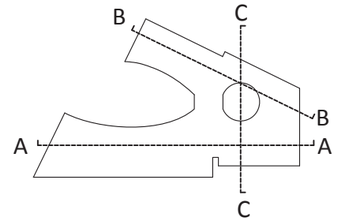
LATTE STONE

LEVEL B3



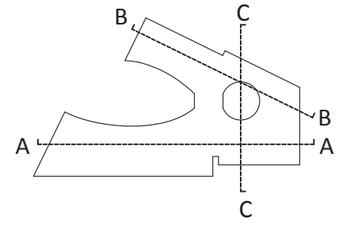
LATTE STONE
LEVEL B4

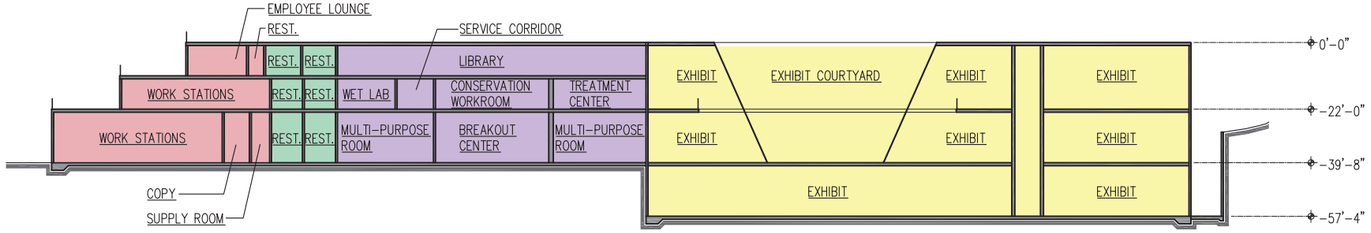




LATTE STONE

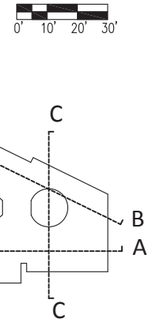
BUILDING SECTION AA

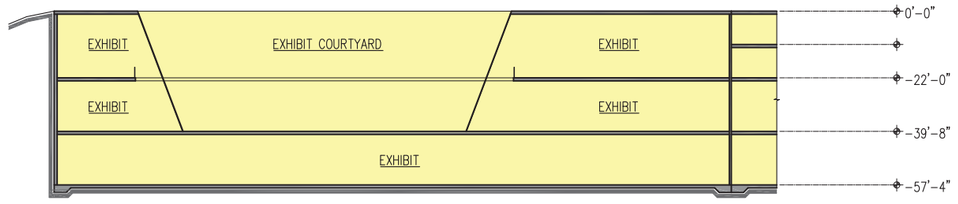




LATTE STONE

BUILDING SECTION BB



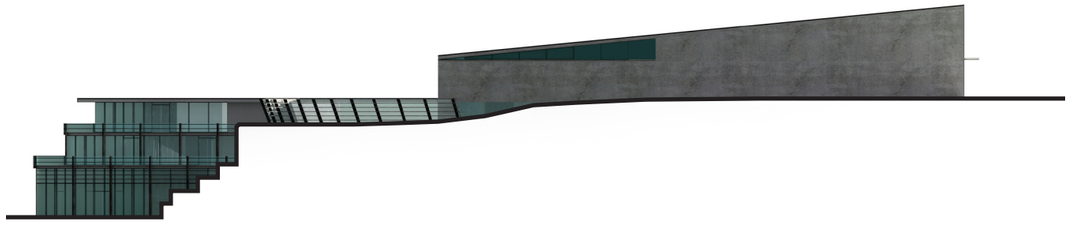


LATTE STONE

BUILDING SECTION CC

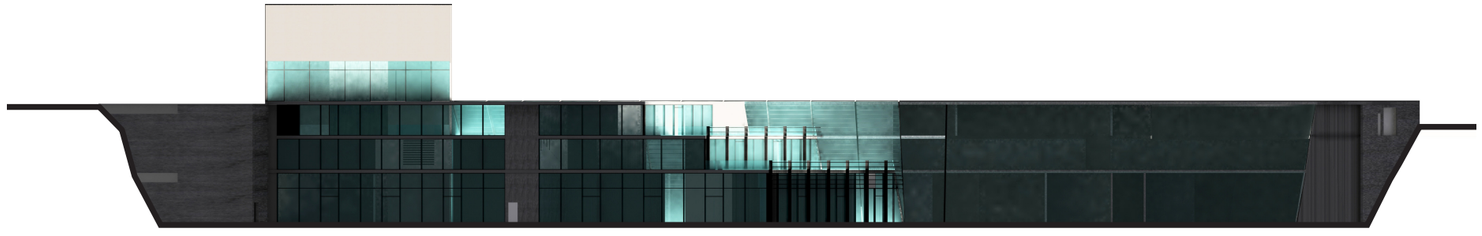
0' 10' 20' 30'

LATTE STONE
EAST EXTERIOR ELEVATION



LATTE STONE
WEST EXTERIOR ELEVATION

0' 10' 20' 30'



LATTE STONE
NORTH EXTERIOR ELEVATION

LATTE STONE
SOUTH EXTERIOR ELEVATION

SUSTAINABLE DESIGN

Architecture has a big impact on the environment on many different levels. The built environment has the opportunity to exist over the years and be seen and used by many generations. As a result, it was very important to design a structure that was environmentally friendly and employ sustainable design techniques. These strategies are found throughout the building including the, building envelope, lighting, cooling, energy production, and water and waste.

Building Envelope

Building orientation is a simple way to take advantage of the natural conditions of the site. In the case of the CCRC, the large site allowed the building to be located along the east-west axis, while also taking advantage of the views. The building orientation helps to locate the appropriate location of windows and where it is best to have a solid wall to control heat gain.

With the CCRC an earth sheltered building, green roofs make up a majority of the roof types protecting the Center. The green roofs allow for a non-disrupted view out to the ocean, limiting the impact of the building from the street level. In addition to being aesthetically pleasing, the green roofs are also used to provide for rainwater retention. The water gathered is used for landscaping irrigation.

Lighting

Natural lighting could be somewhat difficult to obtain for an earth sheltered building. However, if done correctly, it can be advantages for interior spaces. Early in the schematic phase, daylight zoning was addressed, which impacted the building's massing and zoning of activities. Depending on the type of activities taking place in the space determined where it was located within the building. For instance, areas such as the Research Center and Administration that would be used during regular working hours were located in Zone 1, where natural light is abundant. For a space such as the theater where controlled lighting is required, it is located at the back of the building furthest into the earth. Likewise, spaces that require light but are not used all the time are positioned at the hotter areas of the building in the path of the direct sunlight. The mass provides a buffer from the sun and heat for the spaces beyond. This particularly was the case for the spaces along the southern façade of Zone 1, where spaces such as the file room and conferences were located.

Sidelighting was another strategy employed in the building to provide natural light to penetrate into the spaces. This particular technique was used in the exhibit, where a light shaft allows light to travel below to reach the three floors. The light is transferred through high windows that wrap around the northern and eastern walls of the space. On Level B1, the loading and receiving space, as well as the maintenance department, have toplighting via sola-tubes, which admits ambient daylight.

Shading devices are another type of lighting strategy used in the building to reduce the building heat gains from solar radiation. Horizontal shading devises are located in Zone 1 along the

south and west facades of the building, blocking the harsh late afternoon sunlight. The shading devices double as a source of energy, with photovoltaic film on the devices to take advantage of the sun and generate power.

Cooling

Although the building's orientation was reversed and did not allow wind to enter through the courtyards, the wind is instead shielded. This allows it to sweep across the building and remove the hot air. The major cooling factor of the CCRC is simply the type of building it is, that being earth sheltered. Not only does this cut down the cost of building maintenance and but it is also a source of cooling. The subterranean environment provides a cooler environment in hot climates compared to the atmospheric environment above grade. As a result, it reduces the cooling loads necessary for a comfortable interior setting. Another positive factor of an earth sheltered building is that it provides protection from high winds, in particular the typhoons that are frequent to the island.

Energy Production

On-site energy production is an option that can reduce environmental impact. Based on the location of the CCRC, two of the best strategies are photovoltaics and wind turbines. As previously stated, the photovoltaics are located at two places of the building, both are directed

toward the south to capture the low afternoon rays. The photovoltaics are found above the main entry on the Entry Level, as well as the shading devices used to protect Zone 1 from the sun.

With the building located along a cliff side, the site will be experiencing winds of higher speed. To take advantage of this, wind turbines are located across the landscape, blending with the natural vegetation scattered on the site. A row of wind turbines run along the driveway that access the building.

Water and Waste

Guam has two seasons, wet and dry season. As indicated in the Climate Chart in the Site Analysis section, wet season occurs during the months of July through December. To capitalize on the heavy rainfall, the CCRC design utilizes several sustainable design elements including the water catchment system, pervious surfaces and green roofs.

As mentioned in the Envelope portion of this section, the green roofs are used to gather rainwater and use the grey water for toilets and urinals, as well as landscaping irrigation. This is the same case as the water catchment system located on the Entry Level roof. The large angled plane that shelters the Main Entry, gathers additional rainfall to be used for the same purpose as the grey water collected at the green roofs. The rainwater harvesting in turn reduces the consumption of potable water, and ultimately lower the cost of water supply.

The driveway and walkways providing access to the Center are made of porous asphalt pavement. The voids in the material allows water to drain through the pavement and into the ground. The use of this pervious surface reduces the flow of pollutants off site, as well as prevent stormwater runoff, a problem that may occur because of the higher elevation of the site.

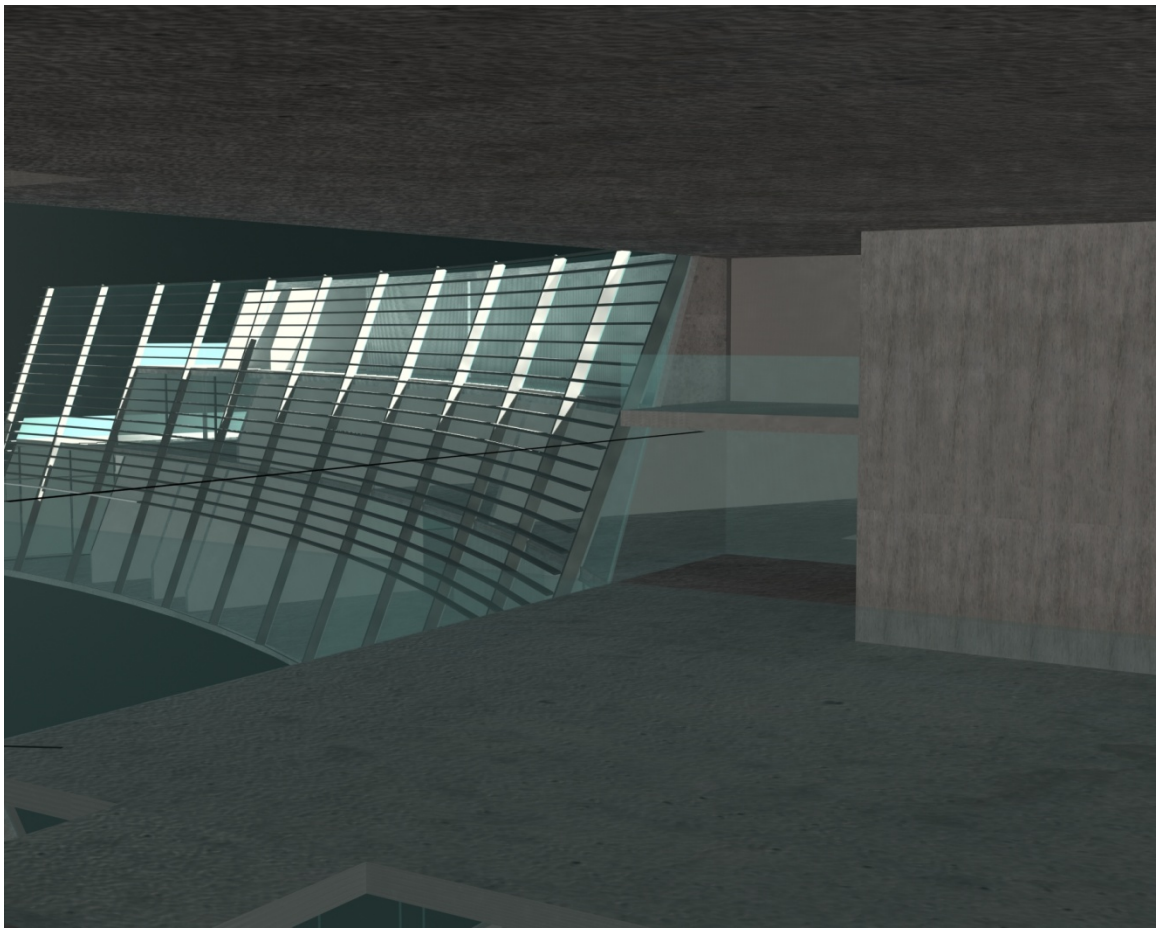
PROBLEMS AND SOLUTIONS

Every design faces obstacles that have to be resolved. Although there were major revisions made to the Center's design to address the problems in the conceptual design, there were still problems that required attention. The main issues included circulation, relation of programmatic spaces and defining the entry.

Circulation

Circulation was perhaps one of the more important items that had to get resolved. However, in order to tackle this issue, the layout of the programmatic elements had to be messaged concurrently. In the conceptual design, the spaces were scattered, forcing visitors to travel long distances to get from one space to another. In particular, the Administration and Research

Figure 43 View of the circulation lobby from Level B1.



Centers were located at the furthest part of the building, away from the main entry. This would have made it confusing for visitors, who may not know where to go once entering the building. To fix this problem, the building had to be compressed and have a closer dialog between the spaces. Creating a main vertical circulation that was central was vital. By having access to all the spaces from one location would make it easy for visitors to move through the building. As a result, the spaces were moved around to allow their main entries to feed off the circulation lobby. The circulation lobby is at the center, with the Administration and Research Center to the north, Exhibit to the east and Cultural Center and Services to the west. Instead of minimizing

the number of floors and having a large building footprint, the spaces were stacked allowing the building to be tightened.

Program Relation

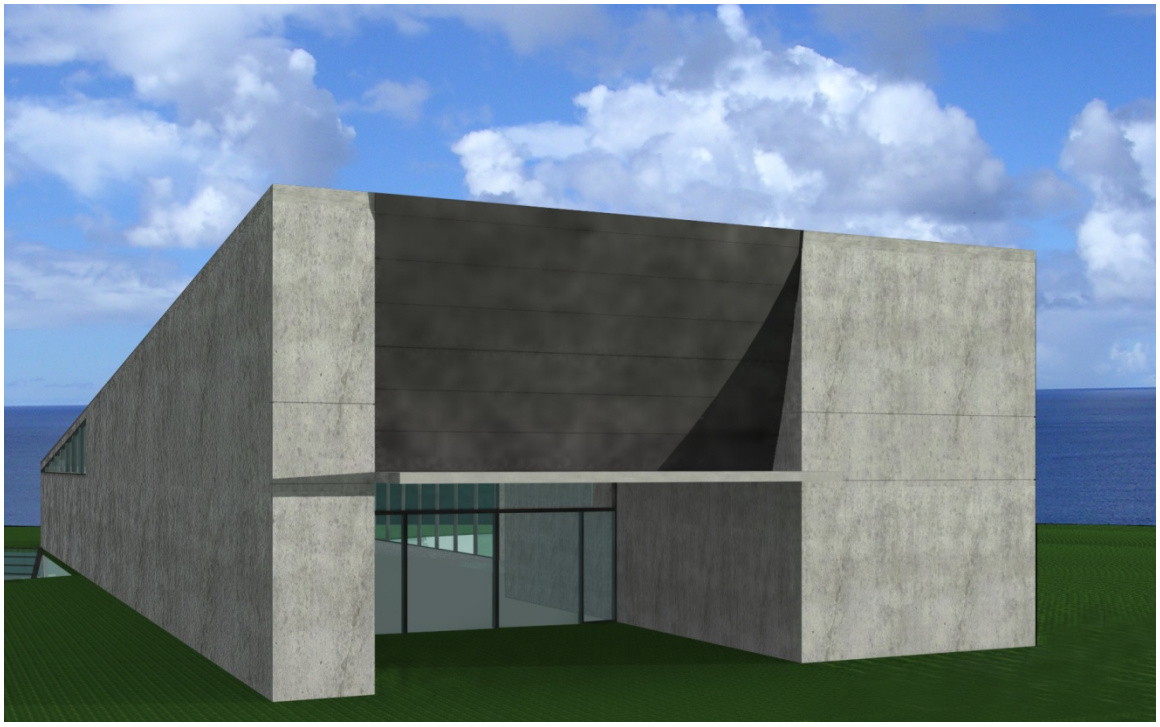
Another way the relation of the programmatic spaces was resolved was by simply organizing them. Based on the function, spaces were grouped together. Administration grouped with Administration, Research with Research, etc. The problem first appeared when the restaurant was clear across the courtyard from the other Cultural Center spaces. This proved to be a problem because those who take in a performance will have to travel a distance to dine after the show. Understanding how people would move through the building played an important part in resolving this problem. Simple diagrams showing the path of travel for visitors, workers, deliveries, etc. outlined where things had to be. It pointed out the relationships between the spaces and showed the necessary adjacencies.

The location of loading and receiving was a constant problem throughout the entire design process. One of the main reasons is that the site has gorgeous views almost from every angle, so it was difficult to determine what the worst part of the building was and hence the best location for the loading and receiving. In the previous designs, the loading and receiving always end up being a distance from everything that it services. There was always a sacrifice, whether it was too far from the kitchen, exhibit or theater. In the final design, this problem was resolved by having these spaces close to the loading and receiving, vertically. As shown in the floor plans, the loading and receiving is located on Level B1, below it are the kitchen, theater and exhibit

studio and lastly the collection archive. With a service elevator uniting all the spaces, it made the travel distance efficient.

Establishing an Entry

Figure 44 View of the CCRC's main entry.



Having a central circulation lobby also assisted in resolving another problem of creating a powerful entry into the building. As previously stated, the goal of the design was to minimize the impact at the street level, however it was also necessary to let visitors know where they had to go. Creating this impact that they have arrived was key to identifying the building. In the conceptual design, visitors had to travel down a ramp to access the building. There was no type

of structure that protruded off the ground that helped to identify the location of the ramp. To resolve that problem, the main lobby was moved to the surface. With a roof angled out from the earth, as if cutting into it, the main entry stood. With efforts not to take away from the rest of the building, the main entry was housed in a very simple rectangular shape. To identify the entry, a portion of the south wall was curved, as if a latte stone's *tasa*. The entire building is made of concrete and glass, with the curve made from photovoltaics to create a different texture at the entry. Directly below this gesture was a large opening that protruded out towards the driveway, where visitors walk under and into the building.

CONCLUSION

The Chamorro Cultural and Research Center was to be an architectural expression that celebrates the culture of the indigenous Chamorros of Guam. Through research and design inspired by a strong concept, it is exactly that. It is a building never done before on Guam, the first of its kind to join the research and cultural history of the island under one roof. It is the home to the artifacts left behind by the Ancient Chamorros and those following. Not only does it exhibit the history, but it provides a place to continue learning and uncovering who exactly are the Ancient Chamorros. With the Defense expansion occurring in the near future, it is important more than ever to have such a building that will continue the legacy of the indigenous people of Guam.

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